

REVISIONAL NOTES ON AFRICAN CHARAXES (LEPIDOPTERA: NYMPHALIDAE)

PART VII

By V. G. L. VAN SOMEREN

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SYNOPSIS

Nine species and their subspecies and forms are dealt with in this paper, in which eleven new subspecies are described and one name synonymized.

I. *CHARAXES CASTOR* CRAMER AND *CHARAXES HANSALII* FELDER

Charaxes castor Cramer

THIS is a wide-spread species, extending from the west coast of Africa (Guinea) across Africa to the east coast, south to Delagoa Bay and to the Comoro Islands. Several forms have been described and named, but true subspeciation has only taken place in the eastern parts of its range. Apart from variation of the underside, especially in the ground colour, there is evidence of alteration in the size of the insect, presumably in response to its environment. Thus specimens from the Ivory Coast, though agreeing in colour and pattern with nominate *castor* and those from further east in the Congo and Uganda, are small in comparison. On the east coast, nominate *castor* is replaced by *flavifasciatus*, which is a paler-barred insect, but we find that on Pemba Island the endemic race is strongly orange-banded, and the race on the Comoro Islands is even more orange. In the drier parts of Ethiopia and Somalia, the place of *castor* is taken by an allied species *hansalii*, but there is now considerable overlap of the two species.

The wide distribution and success of the species appears to be due, in part, to the multiplicity of its food plants, most of which are abundant throughout its range. (*Vide* Biological Note, *post.*)

Charaxes castor castor Cramer

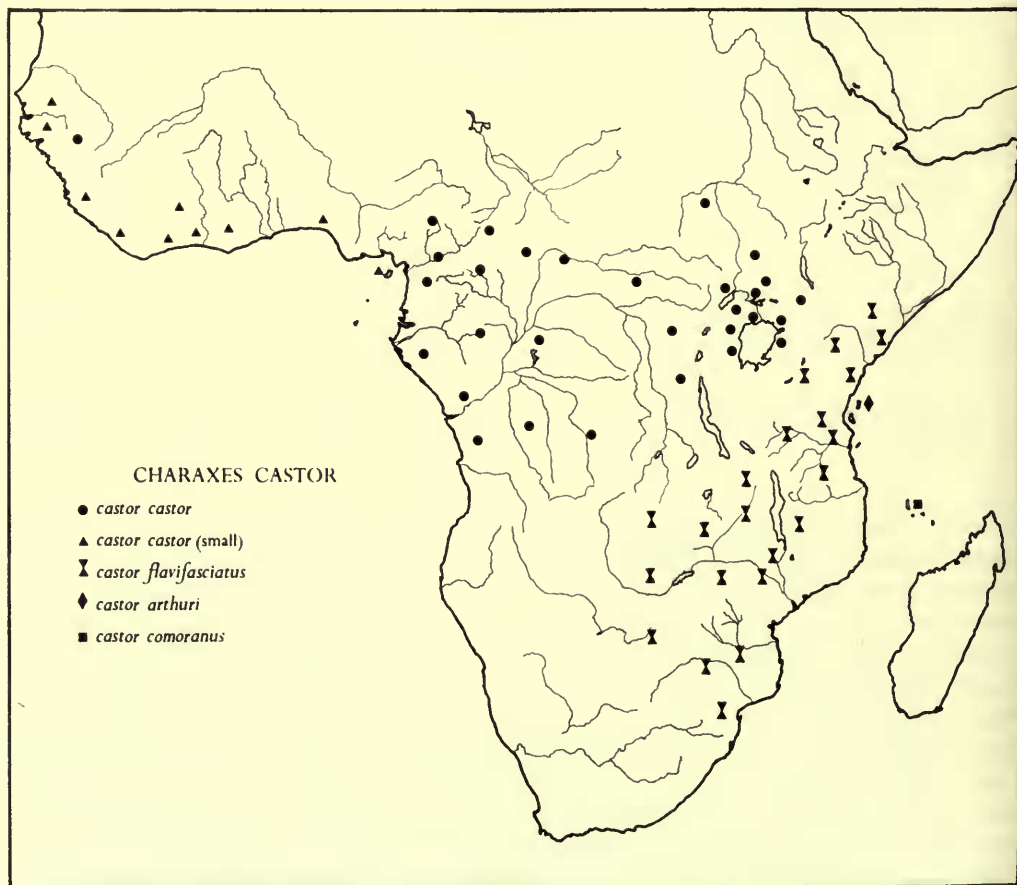
(Pls 1-2, figs 1-7, Map 1)

Papilio Eques Achivus castor Cramer, 1775, 1776 : 61.

For full synonymy, *vide* Stichel, 1939 : 398-402.

AREA I. SENEGAL, GUINEA, SIERRA LEONE

MALE. Fore wing length 45-50 mm. Shape of fore wing narrow with elongate appearance, rather pointed, but outer margin not strongly incurved. *Upperside*. Ground colour of fore wing brownish black, blacker over the cell and outer border. Disc of wing crossed by an orange-ochre band, rather narrow at hind margin in 1a and 1b, 5 mm where the marks are somewhat quadrate, band divides into two at 2, the discal marks in 2-3 deeply incised on outer border;



MAP 1

mark in 4 narrow, elongate, those in 5 and 6 set out and more quadrate, or the upper one may be angled on outer border. The postdiscal marks are smaller, but increasing in size from 2 to the subcosta, the lower spots may be conjoined to the marks in 2-3 in their lower parts. Margin with only a trace of whitish fringe. Hind wing ground colour brownish black, shading to more greyish on the inner fold; border black; discal bar widest at the costa, 8-7 mm, tapering rapidly to a point at 5, the costal part often whitish, the rest orange rufescent, deepening in shade at apex. Submargin with conspicuous blue spots above anal angle and in the two spaces above, seldom with a trace beyond; admargin with blue interrupted broken lunules to 5-6, shading to orange ochreous toward upper angle; border black, with white fringe between ends of veins; margin bluntly dentate. Tails black, upper 4 mm, lower 6 mm. *Underside*. Fore wing ground colour at basal half of wings black, which is the dominant form. The subcostal area crossed by white bars, a double bar at base, followed by an 'O' or 'U' mark, then a single line, then a close-set double line, all in the cell; an irregular 'V' mark beyond; basal white lines present in 1b-3. The discal bar is here represented by irregular-shaped white marks in the discal line and by an ochreous line in the postdiscal row, the two rows separated by black triangular marks increasing in size from 2 to costa. The border of the wing greyer in ground colour than base, with a row of black marks of decreasing size, large and double in 1b, and extending to the costa, these marks distally bordered with silvery grey or greenish grey; margin with obscure greyish lunules, interrupted by black. Hind wing ground colour black to discal line, crossed by irregular double silvery lines, in parallel formation on inner fold. Discal band silvery white, widest at the costa, 4-5 mm, narrower than above, tapering rather strongly to above anal angle, then crossing the inner fold at an obtuse angle. Postdiscal zone with a strong deep purplish chestnut band, serrate on its outer edge and abutting on a zone of grey, widest at tornus and ornamented with silvery grey angular marks at tornus, becoming less angular and more rounded and forming ocelli between tails, the anal angle olive-black in ground colour, carrying two lilac spots, this and ocellus outlined proximally by ochreous olive, extending as a line up the admargin of the wing which is black, edged narrowly with a white fringe. The above description of the underside applies to a majority of *castor* but was described as var. *godarti* Aurivillius to distinguish it from the type of nominate *castor*, which has the basal portions of the wings chestnut. (Pl. 1, fig. 1.)

In nominate *castor*, the ground colour of the bases of fore and hind wings are chestnut.

Variation. *antiqua* Le Cerf, 1923. The type-specimen, from Old Calabar, which has been examined, is a female, and is very old and faded, and one wonders why the specimen was described and given a name. However it is well named '*antiqua*'! *Upperside*. The ground colour, more brown than black, is normal in this sex; the orange bar is dull, especially the postdiscal series of spots which are slightly suppressed. On the hind wing, the submarginal and admarginal spots are obscured. *Underside*. The whole surface is so rubbed that it is difficult to make out what was the original coloration, but nevertheless the outer border of the fore wing appears to be a smoky grey, with the black spots obscured. On the hind wing, the chestnut band is dull, paler and narrower than normal; the admarginal orange line is very distinct.

FEMALE. Usually larger than the male and with more or less the same elongate form of fore wing. Fore wing length 55 mm. *Upperside*. Ground colour is less intense black, more brownish in the basal areas and less deep black on the borders. The ochreous orange bar, though similar in formation, is slightly less deep orange and duller and wider. The same remarks apply to the hind wing as regards to general colour and formation of the abbreviated discal band. The tails are longer and thinner, upper 10 mm, lower 10 mm. *Underside*. Very similar to that of the male; in the fore wing the discal bar is buff rather than white, and the postdiscal spots usually separated and duller. The submarginal black marks show up more strongly on a greyer ground. (Pl. 1, fig. 2).

AREA 2. IVORY COAST, GHANA, W. NIGERIA

We have noted that specimens from the Ivory Coast and Ghana are smaller as a rule; the males have a fore wing length of 45 mm-46 mm; they are also blacker in ground colour, with

strongly contrasting orange bars. The hind wing submarginal blue spots are small and may be reduced in number or be almost obsolete. There is no noticeable difference on the underside.

AREA 3. CENTRAL AFRICAN REPUBLIC, CAMEROUN, MOYEN CONGO, GABON, FERNANDO PO, N. ANGOLA, CONGO, N. KATANGA, UGANDA, N. W. KENYA, S. ETHIOPIA, LAKE VICTORIA & N. W. TANZANIA.

MALE. Fore wing length uniform 50–53 mm. *Upperside*. Ground colour of fore wing deep velvety brown-black, blacker on the borders of wings. Disco-postdiscal orange bar strong; margin with minute white dots more in evidence at the tornus. Hind wing ground colour as fore, slightly browner at base and along the inner fold, where there may be a obscure whitish line above anal angle. Submarginal blue spots usually strong and bluer, but may be obscured above upper tail. Upper tail short, sharply pointed, 3–4 mm, lower 9 mm, often slightly curved. *Underside*. As in the more western specimens, but pattern usually bolder and stronger, the purplish chestnut band in the hind wing being very well developed. (Pl. 1, fig. 3.)

FEMALE. Fore wing length 56–58 mm. *Upperside*. Ground colour not so deep black as male, but more brownish. Fore wing discal bar well developed and slightly paler than in males; marginal white spots more in evidence. Hind wing discal bar paler, the submarginal blue spots strong, with vestige of spots to 5; admarginal blue lunules strong, shading to orange from 5 to upper angle. Underside as in male but pattern bolder. (Pl. 1, fig. 4.)

It is of interest to note that specimens in this area from Bangui, Central African Republic run to considerable size, males have the fore wing length up to 50 mm and females up to 60 mm, thus agreeing more with the specimens from the Congo and Uganda.

Female aberrations: 1) *flavimarginalis* Stoneham (1936: 2) is an otherwise normal female with most of the admarginal lunules in the hind wing ochre in colour.

2) An interesting aberration has large blue submarginal spots extending from the anal angle to upper angle. (Pl. 1, fig. 5.)

Male aberrations: 1) Aberration *aginga* Stoneham (1931: 1) is almost entirely melanistic on the fore wing, but the two upper postdiscal spots are still visible, the rest of the discal and postdiscal spots almost entirely obliterated. On the hind wing, which is also melanistic, there is a remnant of the orange discal bar in the costal region; the submarginal blue spots are strong to 5; the admarginal lunules obscured, but the white fringe on edge of wing strong above upper tail. Underside pattern more or less as in the normal male, but the discal bar is greyish white; the postdiscal orange spots reduced in size; the outer border of wing strongly greyish in ground colour, but black marks are reduced in size. Hind wing shows little change except that the purplish chestnut marks are reduced in size and more separated; the border of wing more greyish, the orange admarginal line obscured.

2) An aberration very similar to *aginga*, but fore wing blacker, with no clear orange spots in postdiscal line, but just the faintest indication of the joint bar visible. Tornus with two ochreous spots in 1b. Hind wing with a mere trace of the discal bar in subcostal region, the submarginal blue spots bold, and in diminishing size, extend to the upper angle; the admarginal lunules are strong, blue to upper tail, then orange to upper angle. Underside as in *aginga*, the fore wing discal bar is greyish white, more greyish in subcostal region while the postdiscal orange spots are reduced and separated; the border of the wing grey, with the black marks clear. On the hind wing the pattern is almost normal, though the admarginal border is greyish ochre to orange. Edge black with bold white fringe. (Pl. 2, fig. 6.)

3) A melanistic aberration which on the upper side retains bold orange marks of very reduced size in the discal line, and barely a trace of marks beyond in both lines. On the hind wing the whole is melanic, leaving only a trace of the discal bar in subcostal area. The blue submarginal spots limited to a double blue spot in the anal angle and smaller spots in spaces above. No trace of an admarginal line, but white fringe on edge distinct. Underside, the whole base of the fore wing except for basal half of costa and area 1a, solidly black. In the discal line the

bar is reduced and buffish in colour to 2, the upper marks reduced in size and greyish in colour; in the postdiscal line the orange bar is strong in 1b then becomes obscured; the submarginal black marks, large at tornus, are obscured by the dark blue-grey of the ground colour on border; the margin carries a series of black marks. Hind wing: basal area to discal line jet-black with just a few white lines on inner fold; the discal bar is white, shading to greyish then black at anal angle, this greyish band crossed by strong black rays; border of wing black, fringe white. (Pl. 2, fig. 7.)

RANGE. From Guinea, Senegal, Sierra Leone, Ivory Coast, Ghana, and western Nigeria for the small ecological form. From Cameroun, Central African Republic, Moyen Congo, Gabon, Fernando Po, N. Angola, Congo and N. Katanga to Uganda, N. W. Kenya, S. W. Abyssinia and N. W. Tanzania for the larger ecological form.

Charaxes castor flavifasciatus Butler

(Pl. 2, figs 8, 9, Map 1)

Charaxes castor var. *flavifasciatus* Butler, 1895 : 251.

?*Charaxes hansalii* Butler, nec Felder, 1891 : 42.

Charaxes castor var. *orientalis* Lanz, H., 1896 : 140.

Differs from nominate *castor* by its generally lighter, more brownish ground colour at bases of wings, and paler ochreous bars on fore and hind wings. It thus bears some resemblance to *Charaxes hansalii* Felder, with which it might be confused, especially with the larger subspecies *baringana*. There is some variation in the ground colour of the upperside, which is not related to season or environment, the colour varying from black to rufous; this occurs in both sexes. On average smaller than *castor castor*, except the small form of Ivory Coast, the males varying in fore wing length from 44-49 mm, and the females from 50-55 mm.

MALE. Shape of fore wing very similar to *castor*, but less elongate, the outer margin slightly incurved at 2-3. *Upperside*. Ground colour at base of wing brownish black or black, darker in region of disc and outer border; the margin of wing with distinct whitish marks; the discopostdiscal bar paler ochreous orange to ochreous, formed in similar manner to *castor*. Hind wing brownish black to grey-brown at base, shading to grey or almost whitish on inner fold, with a whitish spot on fold above anal angle. Discal bar pale orange-ochre to ochre, whiter at the costa, tapers to lower part of cell where it becomes dyslegnic. Border of wing broadly black, the hind angle with three or four blue spots, double and largest at anal lobe, the spots diminishing in size; admarginal with series of lunules, greenish at anal angle, then blue to 5, shading to ochreous at upper angle; these lunules may be broken and become obsolete toward the upper angle. Tails thin and sharply pointed, upper 7 mm, lower 11 mm, black. *Underside*. Pattern basically similar to that of *castor castor* but generally brighter. Fore wing, ground colour at base of wing chestnut, crossed by black bar strongly bordered in white; the discal bar satiny white, separated from the postdiscal ochreous line by rounded black marks; border of wing silvery bluish grey in which the graduated submarginal black marks show up strongly; margin with alternating black and white linear marks. Hind wing basal area chestnut with pattern of black bars outlined in white, finer than in *castor castor*; the discal silvery bar narrower than orange bar above, more tapering, and extending to above the anal angle where it crosses the inner fold at an oblique angle; chestnut zone strong, the marks distally angled and outlined in white and intruding into the greyish submarginal band; the admarginal ochreous line shading to whitish distally, is bounded proximally by a row of fine black lunules; marginal black lunules with white fringe well marked. (Pl. 2, fig. 8.)

FEMALE. *Upperside*. Coloration very similar to male, slightly more brownish at base of

wings. Pattern of fore wing similar, marginal white streaks bolder. Hind wing as in the male, discal bar equally pale ochreous; submarginal blue spots usually larger; the admarginal lunules bolder, bluish green at anal angle, shading to whitish then ochre at the upper angle. Margin of wing bluntly dentate, but tails long and thin, 10–13 mm, black. *Underside*. Pattern as in the male, but bolder. The hind wing admarginal ochreous line bolder, often shading to whitish distally. (Pl. 2, fig. 9.)

Variation. *reimeri* Rothschild, 1900, only differs in having the ground colour at bases of wings on the underside black, instead of chestnut. Locality. Tanzania, Dar-es-salaam.

RANGE. Malawi, occurring also in Manicaland, N. Transvaal, N. Natal, Mozambique, Rhodesia and Zambia; ranging through Tanzania mainly in south, east and north to Kilimanjaro area; common in Kenya from the coastal belt inland to Teita and Ukambani, all east of the Rift Valley.

Charaxes castor arthuri ssp. n.

(Pl. 2, figs 10, 11; Pl. 3, figs 12, 13, Map 1)

This interesting new race of *castor* was brought to light when Dr Arthur Rydon paid a brief visit to the island of Pemba in September 1963, in search of the elusive female of *Charaxes pемbanus* Rothschild. By the use of special traps he succeeded in taking one male and four females of *castor*. Although Pemba Island is near the east coast of Tanzania, east of Tanga, it is separated from the mainland by a deep channel, fathoms deeper than the shallow channel between Zanzibar and the mainland (*Vide* van Someren, 1966: Map C).

Because of the proximity of Pemba to the Tanzanian coast, one might have expected that the representative of *castor* on that island to be identical with, or near to the mainland race *flavifasciatus* Butler, but on the contrary, it bears a closer resemblance in pattern and colour to the nominate *castor castor* of central Africa.

MALE. Fore wing length 46 mm; shape slightly less elongate than *castor castor*, and generally similar to *flavifasciatus*. *Upperside*. Fore wing, ground colour black, slightly browner at base. The disco-postdiscal bars dark orange-ochreous as in *castor castor*, the discal spots in 2–6 smaller, so that the postdiscal spots in 2–4 are more separated from those of the discal bar and more discrete, those of 5–7 less curved toward the costa; marginal whitish spots very small. Hind wing ground colour at base brownish black, shading to greyish brown on inner fold; outer border of wing black; submarginal blue spots small; admarginal blue lunules strong at hind angle but fading out above upper tail, but spot at upper angle white. Margin black with white fringe between the blunt serrations. Tails short, upper 5 mm, lower ? (broken). *Underside*. Fore wing ground colour at base of wing chestnut; white-bordered black bars strong; base of 1a–1b greyish; discal bar slightly buffish white, postdiscal orange-ochre line broken into separate spots; the black submarginal graduated marks distinct, edged bluish grey distally; border of wing greyish, traversed by faint black lunules from tornus to apex; edge black interrupted by white lines. Hind wing ground colour chestnut with the usual white-bordered black marks strong; discal bar white, outer border kinked at cell, tapering toward anal angle and crossing the inner fold at an oblique angle where it becomes slightly buffish. The zone of chestnut triangles, edged greyish, are on a darker greyish ground; admarginal bluish orange line well developed, forming an ocellus, with two lilac spots in the anal lobe. Edge black with white internervular fringe. (Pl. 2, figs 10, 11.)

FEMALE. Fore wing length 55–56 mm. Shape as in the male or less incurved on the outer border. *Upperside*. Fore wing ground colour deep brownish black; border blacker. A trace of an orange spot at end of cell and one beyond in two specimens. Disco-postdiscal orange-

ochre bar as in the male. Margin of wing with minute white linear marks. Hind wing ground colour greyish brown at base fading to smoky grey on inner fold, paler mark above anal angle. Discal bar pale at costa, then more strongly ochre, tapering toward the cell where it merges into the ground colour and is dyslegnic. Border of wing broadly black; submarginal blue spots at hind angle rather linear; admarginal blue line to above upper tail shades to ochreous at upper angle; margin bluntly serrate, tails long and thin, upper 11 mm, lower 11 mm, slightly curved. *Underside*. Fore wing coloration and pattern as in the male, but bolder. Hind wing orange-bluish, admarginal line strong, forming ocellus at anal angle which carries two lilac spots, a series of lilac linear marks in spaces above. (Pl. 3, figs. 12, 13.)

Holotype male. PEMBA ISLAND: ix.1963 (*Arthur Rydon*).

Allotype female, same data. To be deposited in the B.M.(N.H.).

Paratypes. Two females, same date.

RANGE. Known only from Pemba Island.

Charaxes castor comoranus Rothschild

(Pl. 3, figs 14, 15, Map 1)

Charaxes castor comoranus Rothschild, 1903 : 310.

This insular race of *castor* from the Grande Comoro Islands presents most interesting features, particularly the depth of colour of the fore wing bar, and the ground colour of the bases of the wings on the underside, both of which bear a closer resemblance to *castor* of western Africa than to *flavifasciatus* of the eastern mainland. (Cf. note on *Ch. c. arthuri*, above.)

MALE. Fore wing length 50–51 mm; shape similar to that of the mainland race and *arthuri* of Pemba Island. *Upperside*. Fore wing ground colour black, slightly browner at base; disco-postdiscal bar deep orange-ochre to tawny orange, the marks in 2–3 strongly angled, that in 4 linear, those in 5–6 quadrate and angular; the postdiscal series of spots well separated from the discal ones, small and ovoid, that at subcosta larger and quadrate. Margin of wing without any white spots. Hind wing ground colour black, more greyish on the inner fold, border of wing broadly black; discal bar short, paler at the costa but shading to rich tawny orange over the cell. Hardly any trace of submarginal spots at hind angle; admarginal line of blue spots greenish at anal angle, then blue, shading to orange at upper angle; margin bluntly serrate with just a trace of white fringe between ends of veins; tails black, short, upper 5 mm, lower 6 mm. *Underside*. Fore wing basically similar to *flavifasciatus* and differs from *arthuri* in that the ground colour at the bases of the wings is black, not chestnut; moreover the white bordered black marks are as bold as in nominate *castor*. In the hind wing the admarginal ochreous-bluish band is broad, and the discal white bar does not cross the inner fold so obviously, the line being very narrowed. (Pl. 3, fig. 14.)

FEMALE. Fore wing length 60 mm. *Upperside*. Fore wing ground colour browner than that of the male but orange-ochre disco-postdiscal bar is similar, though bolder. The edge of the wing without white marks. Hind wing basal area brownish black, more smoky grey on the inner fold with a narrow paler grey mark above the anal angle. Discal bar, pale at costa, darkens to rich ochreous at the cell where it tapers out; border of wing broadly black, the submarginal blue spots at hind angle not strongly marked; the admarginal blue line obscured above upper tail, but represented by an ochreous spot at upper angle. Margin with slight white internervular fringe; edge bluntly serrate, tails comparatively short and thick, upper 7 mm, lower 9 mm. *Underside*. Fore wing ground colour and pattern as in the male but bolder; the upper postdiscal orange spots shading to whitish. On the hind wing there is little

difference from the male except that the pattern is larger, and the black spots at the convergence of vein 4 and 5 large and conspicuous. (Pl. 3, fig. 15.)

RANGE. Confined to Grande Comoro, Mayotte and Comoro Islands.

Biological Note

It was noted in the introductory remarks that *castor* was a highly successful species, probably due to the abundance of its multiple food plants; amongst these we have listed:—Gramineae, *Sorghum* spp. very commonly; Celastraceae, *Gymnosporia senegalensis*, et al.; Ulmaceae, *Chaetacme macrocarpa*; Caesalpinaceae, *Afzelia cuanzensis* & *Afzelia* sp.; *Bauhinia* spp.; *Brachystegia* spp., *Erythrina* sp.; *Entada* sp.; Euphorbiaceae, *Tragia* spp.

For full life history, *vide* van Someren (1926 : 338); van Someren & Rogers (1928 : 12); van Someren & Rogers (1929 and 1930): 31 & 33.

Charaxes hansalii hansalii Felder

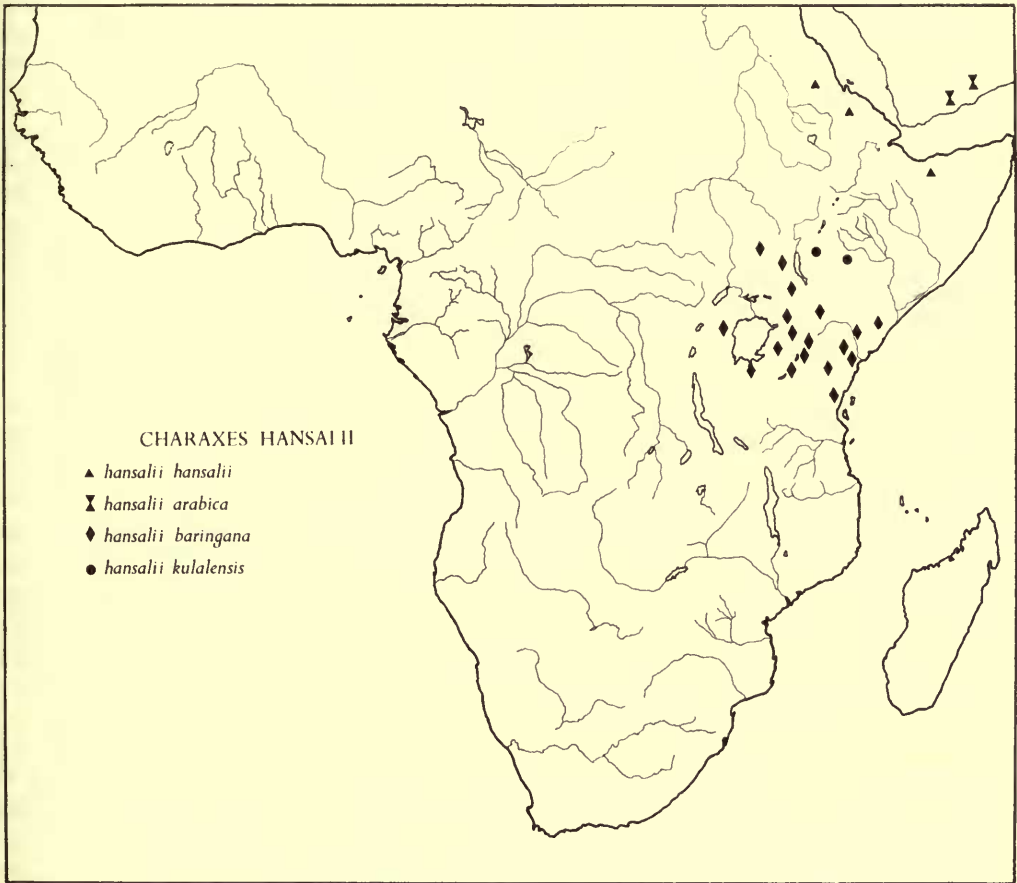
(Pl. 3, figs 16, Map 2)

Charaxes hansalii Felder, 1866 : 446, Pl. 59, figs 5-6.

MALE. Fore wing length 38-40 mm. *Upperside*. Fore wing shape rather pointed at apex, outer margin slightly incurved. Ground colour at base olive-brownish, shading to black beyond cell and outer border; an obscure ochreous spot usually present beyond end of cell; discal bar strongly developed, creamy ochre in colour, crossing the wing from the hind border to subapex, 5-7 mm wide at hind margin in 1a-1b, spot in 2 smaller, outer border oblique, spot in 3 similar in shape but set out slightly, mark in 4 elongate, that in 5 again set out and quadrate in shape, the spot in 6 more triangular, two smaller spots in subapex in 6-7, part of a postdiscal series. Margin of wing with distinct creamy internervular marks, double at tornus in 1b. Hind wing basal area olive-brown, shading to more greyish on inner fold, slightly white-edged above anal angle. Distal border of wing broadly black; discal band creamy white in colour at costa, 6 mm wide which becomes slightly darker cream and tapers slightly, then merges into the inner fold above the anal angle. Submargin with small blue spots, double at anal angle, which decrease in size and become obsolete at upper tail; margin with strong creamy linear marks, greenish at anal angle; margin very bluntly dentate, tails long and thin, black in colour, 5-7 mm long. *Underside*. Fore wing ground colour pale chestnut or reddish hazel, crossed in the costal region by black bar narrowly outlined in white, the bars abutting on the discal bar are black. Discal bar white, similar in shape to that above, the marks in 2-5 with oval black marks on distal border, the black spots extending to subcosta between the discal and postdiscal white marks in this area. The white bar distally bordered by a series of reddish hazel lunules or half moons; the border beyond greyish, carrying a series of black rounded spots, double in 1b, diminishing in size as they approach the subcosta at sub-apex. Margin with ochre lunules proximally shaded reddish hazel separated by black spots. Hind wing ground colour reddish hazel, crossed by wavy black lines bordered in white, in parallel series; a black wavy line abuts onto the white discal bar, the distal outline of which is irregular on its borders, and tapering to above the anal angle where it narrows, then expands at the inner fold. There is a conspicuous black spot within the white bar between veins 4 and 5, which is sometimes represented on the upper surface. The bar is distally bordered by a series of black lunules with bluish green shading proximally, double at anal angle; the admargin with a strong line of cream to ochre lunules bordered on margin by white fringe between ends of veins. (Pl. 3, fig. 16.)

FEMALE. No specimen is available to me, but Rothschild describes it as similar to the male but larger with a fore wing length of 50 mm.

RANGE. Ethiopia, Bogos (type locality) in northern area; also on the Wagga Mts, in Somaliland.



MAP 2

Charaxes hansalii baringana Rothschild

(Pl. 3, figs 17, 18, Map 2)

Charaxes hansalii baringana Rothschild, 1905 : 78.

Described from a single specimen in bad condition, taken in the Baringo district in the Rift Valley, Kenya. This race is now known to be widespread in East Africa. The characters given for *baringana* hold good for the majority of specimens, but there is considerable variation, even in one area. There is also some evidence of reaction to environment, particularly as regards size, not amounting to sub-specific differentiation.

♂ MALE. Fore wing length 39-43 mm. Some males from the Baringo-Kamasia area may vary from 36-42 mm and smaller examples occur in the Suk Country to the north. *Upperside.*

Fore wing. With few exceptions, the basal area is dark brownish olive, darker than nominate *hansalii*, and the disco-postdiscal bar paler and narrower, the postdiscal spots often extending down to 2. The marginal creamy spots larger. Hind wing basal area darker olive-grey, shading to greyish on the inner fold. The discal creamy bar narrower, inward curved on the outer border so that the black border of the wing is wider; the submarginal blue spots, evident at the anal angle, become smaller and die out at 4. *Underside*. The pattern is similar to that of the nominate race but the discal bars narrower, the black spot between veins 4 and 5 on distal side of the white bar variable, from a trace to very strong. (Pl. 3, fig. 17.)

FEMALE. Fore wing length rather variable, 43–50, average 47 mm. *Upperside*. Pattern and coloration generally similar to that of male, but ground colour more brownish olive at bases of wings, the distal portion of the fore wing more brownish black. The disco-postdiscal band of fore wing and that of hind wing broader; the marginal spots on the fore wing and creamy line on admarginal border. *Underside*. Ground colour slightly paler, and pattern generally enlarged compared with that of male. (Pl. 3, fig. 18.)

Variation. One occasionally captures or breeds a female in which the basal fore wing colour is rufescent olive, and the dark borders of both wings, brownish; the discal bars and marginal spots ochreous; the underside similarly brownish.

RANGE. As already indicated, this subspecies occupies a wide area of country in which the ecological environment varies considerably, resulting mainly in variation in size of the insects. Nominate *baringana* came from the low-lying floor of the Rift Valley, in which both Lake Baringo and Lake Hannington lie at between 2500–3000 ft. This type of savanna semi-desert country extends roughly to the south of Lake Rudolf and north into the Suk-Turkana-Karamoja country in Uganda. Specimens from this area are relatively small. However the subspecies also extends into the higher country of 4000–6000 ft; here the specimens are larger, especially in the female sex. In a southerly direction, where the type of country is still savanna, varying from 3000 ft to sea-level, specimens are, on average, large; but there is every degree of intergradation.

Range: Area 1. Baringo, Kamasia, Suk, and Turkana to Karamoja and southern Sudan. Area 2. Samburu, Ukambani, Masai country, Teita and Shimba Hills and Sekoke-Arabuko on the Kenya coast. Area 3. Trans Nzoia, Kitale district, lower Sotik and Chepalungu, S. Kavirondo, Suna and along the southern shores of Lake Victoria to the western shores of the lake in the Bukoba area.

Charaxes hansalii kulalensis ssp. n.

(Pl. 4, figs 19–22, Map 2)

Specimens from the isolated Mt. Kulal in the north-east of Lake Rudolf and a pair from Nighelli, S. Ethiopia differ from *baringana* on the upperside in the ground colour of the basal area of both wings, which is deeper, more olive-black; the distal portions of the wings blacker. There are two or three obscure subcostal ochreous spots in the fore wing, one in the cell, which is not always present, one at end of cell and one beyond. The disco-postdiscal bar is broader and creamy white, paler than in *baringana*; the marginal spots in fore wing and admarginal line in the hind wing bolder, larger and whiter in colour. The underside pattern is stronger and the chestnut basal ground colour darker.

Holotype male. KENYA: Northern Frontier Province, Mt. Kulal, south east of Lake Rudolf, vi.1961 (*H. D. van Someren*). To be deposited in B.M.(N.H.).

Allotype female. Same data. To be deposited in B.M.(N.H.).

Paratypes. Same data, 2 males, 2 females.

RANGE. Kenya, Mt. Kulal, south east of Lake Rudolf; S. Ethiopia, Nighelli.

Charaxes hansalii arabica Riley

(Pl. 4, figs 23, 24, Map 2)

Charaxes hansalii arabica Riley, 1931 : 279.

A male and two females loaned to me by the B.M.(N.H.) are in such bad condition that it is impossible to define the characters of this race adequately. The ground colour of both wings appears darker; the discal band of the male very narrow. I am unable to examine the types which are in the B.M.(N.H.) but give a photograph of them.

RANGE. S. E. Arabia, Qara Mts and Wadi Balsh.

Biological Note

The food plants of all races of *Charaxes hansalii* appear to be *Dobera roxburghi* Pl. and *Salvadora persica* Garcin (Salvadoraceae), especially the latter. Both are found in the drier savanna areas of Kenya and Uganda.

SYSTEMATIC LIST

Charaxes castor Cramer

Charaxes castor castor Cramer, 1775. Type locality: Coast of Guinea.

Range: Area 1. Senegal, Guinea, Sierra Leone. Area 2. Ivory Coast, Ghana and western Nigeria. Area 3. Central African Republic, Cameroun, Moyen Congo, Gabon, Fernando Po, N. Angola, Congo, N. Katanga; Uganda, N.W. Kenya, S. Ethiopia and around Lake Victoria and N. W. Tanzania.

ab. *antigua* Le Cerf, 1923. Nigeria, Calabar.

ab. *aginga* Stoneham, 1931. N. W. Kenya, Trans Nzoia, Kitale.

ab. *flavimarginalis* Stoneham, 1936, N. W. Kenya, Kitale area.

castor flavifasciatus Butler, 1895. Type locality: Malawi, Zomba.

Range: Malawi, Zambia, Mozambique, Manicaland, N. Transvaal, N. Natal, Rhodesia, Tanzania, Kenya Coast and hinterland to Teita and Ukambani; east of the Rift Valley.

Variation: *reimeri* Rothschild, 1900, Tanzania, Dar-es-Salaam.

castor arthuri ssp. n. Type locality: Tanzania, Pemba Island.

Range: Confined to Pemba Island.

castor comoranus Rothschild, 1903. Type locality: Comoro Islands, Mayotte Islands.

Range: Confined to Comoro Islands.

Charaxes hansalii Felder

Charaxes hansalii hansalii Felder, 1866. Type locality: N. Ethiopia, Bogos.

Range: N. Ethiopia, Bogos; also on Wagga Mts, N. Somaliland.

hansalii baringana Rothschild, 1900. Type locality: Kenya, Lake Baringo area.

Range: Area 1. Baringo, Kamasia, Suk, Turkana to Karamoja and S. Sudan. Area 2. Samburu, Ukambani, Masai country, Teita and Shimba Hills and Sekoke Forest, on the Kenya Coast. Area 3. Trans Nzoia, Ktale district, lower Sotik at Chepalungu, S. Kavirondo, Suna and along the southern shores of Lake Victoria to the western shore in the Bukoba area.

hansalii kulalensis ssp. n. Type locality: Kenya, Mt Kulal, south east of Lake Rudolf; S. Ethiopia, Nighelli area.

hansalii arabica Riley, 1931. Type locality: S. E. Arabia.

Range: S. E. Arabia, Qara Mts, and Wadi Balsh.

2. **CHARAXES LUCRETIUS** CRAMER, **CHARAXES ODYSSEUS** STAUDINGER
AND **CHARAXES MONTIERI** STAUDINGER & SCHATZ

Charaxes lucretius Cramer

It has generally been assumed that this species has not evolved into geographical races throughout its entire range from Guinea to North West Kenya, with the exception, perhaps, of the insular *Charaxes lemosi* Joicey & Talbot from the island of Principe in the Gulf of Guinea. *Charaxes lucretius lucida* Le Cerf, 1923, is generally regarded as a synonym of the nominate race, being founded on a male variation from the adjoining territory of Liberia, and a female from Guinea, which is the type-locality of the species. (*Vide* Fox, 1965 : 202.)

There is a general similarity of pattern and coloration, on the upperside, of males from the occidental area and those from the eastern extremity of the range; on the underside, however, western representatives are darker, more richly coloured, more purplish vinaceous in ground colour. Moreover, there is a remarkably constant difference in size; western males measure 35–36 mm in length of fore wing, whereas Ugandan males measure 42–47 mm. There is also a difference in size in the female: 41–42 mm as against 46–49 mm in eastern Ugandan examples. It is interesting to note that examples from the Central African Republic and adjoining territories are intermediate in size. It is a moot point as to whether size-differences constitute sufficient grounds for recognising geographical races, unless accompanied by pattern and colour differences. In the case of *Charaxes lucretius* such differences do exist.

When Rothschild (1900 : 410–413) dealt with the species, he had before him mainly western examples. He noted, however, that females from the 'Congo basin' have very pale bands, and he also noted a difference in Ugandan examples.

From the material now available for study, the species appears divisible into four subspecies.

Charaxes lucretius lucretius (Cramer)

(Pl. 5, figs 25, 26, Map 3)

Papilio eques Achivus lucretius Cramer, 1777 : 129, t. 82, figs e & f.*Papilio Nymphalis lucretius* Fabricius, 1793 : 84.*Charaxes lucretius* Doubleday, 1844 : III.*Charaxes lucretius lucida* Le Cerf, 1923 : 366. **Syn. n.**

MALE. Fore wing length 35–36 mm. *Upperside*. Fore wing base, mainly in the cell area and base of costa rufous cinnamon; a faint trace of a sub-basal black mark, followed by a black mark crescentic or rounded toward the end of the cell, the rufous ground colour seldom extending beyond the cell end; remainder of wing black with a conspicuous postdisical bar of rufous orange spots, widest towards the hind margin, 4–5 mm, where the spots are contiguous, decreasing in size and separated from 2 to subcosta and arranged in almost a straight line; the subcostal spot is often absent. Margin of wing with triangular or semi-lunate rufous orange marks, double in 1b. Hind wing basal area black, shading to more brownish on inner fold and rufous above anal angle. Disco-postdisical rufous orange band of almost even width, though often slightly wider at costa where the mark extends proximad, forming an angle with the spot below, is strongly marked to 3 where it tapers and shades into the black submarginal border, which is



MAP 3

almost straight on its inner border, but strongly dentate on outer, where it impinges on the rufous orange border; margin black, slightly dentate; tails short, sharply pointed, 2-3 mm long; two lilac spots present in anal angle. *Underside*. Fore wing, ground colour reddish chestnut with a strong vinaceous bloom distad, but slightly paler towards hind margin. Black marks in cell, outlined in bluish white, are: one sub-basal, one more pear-shaped, one straight or slightly curved, followed by a thin line at end of cell adjacent to a sub-basal line in 4; other black marks are: small angular marks in 5-7, larger black marks in sub-base 2 and upper part of 1b followed by more angular marks in 1a-2, with a trace in 3. The postdiscal line of ochreous orange spots, pale at hind margin, darken and fade out toward the costa, but are distally accentuated by strong black marks at hind angle, shaded with bluish grey distally, this shading extending up to the subcosta in decreasing amount. Margin with obscure rusty lunules, most conspicuous and double at hind angle and 1b. Hind wing, ground colour reddish chestnut, slightly darker than fore wing, with vinaceous bloom more marked. Basal black lines thin, more or less straight in sub-bases but more angled and broken in discal line. There is a faint indication of the rufous orange bar of upperside which is accentuated on outer border by a darker zigzag chestnut zone which runs from the costa to the anal angle and is distally bordered by a greyish zone, in which the admarginal series of pinkish lunules accentuate the reddish border; margin black, with slight whitish fringe. Anal angle with black dots on a greenish lilac ground. (Pl. 5, fig. 25.)

FEMALE. Fore wing length 40-42 mm. *Upperside*. Fore wing, ground colour, black, usually with some rufous along the basal half of the costa; occasionally some indication of rufous in upper part of mid cell. Wing crossed by a series of graduated ochreous creamy spots forming a conspicuous bar widest at the hind margin where the spots are contiguous, 4-6 mm, the remaining spots separate and reaching 6, sometimes with a trace of a spot in 7. Margin of wing with rather ill-defined ochreous spots, largest at the hind angle in 1b, but fading out toward the apex. Hind wing basal triangle brownish black, shading to greyish buff on the inner fold. Disc of wing crossed by a strong ochreous creamy band widest at costa, 8 mm, where the mark extends proximad, the outer border almost straight and shaded with ochreous orange where it abuts onto the brownish black border, which extends from the upper angle to the anal angle, tapering at both ends, its outer border serrate, accomodating the conspicuous series of ochreous orange lunules; margin black, slightly dentate; tails short, upper 5 mm, lower 3 mm. *Underside*. Fore wing, ground colour fawn-brown with a distinct purplish bloom; the black cell marks slightly greyish edged; the black marks sub-basal in 1b-2 bold, those in the discal line equally strong but lessening in size, the mark in 4 at the base usually small, those in 5-7 angular and often contiguous. The postdiscal bar represented by a series of graduated buff-ochre spots, widest at hind margin, those in 3 to subcosta outlined distally in brownish; the marks in 1b-2 boldly black, triangular in shape on a submarginal violet-grey ground; edge of wing browner, the hind angle at 1b with two buff spots. Hind wing, ground colour as fore wing but slightly darker; the basal lines thin, but those on the inner border of the buffish bar stronger, the bar is wider than on upperside and more graduated, extending from the costa to above the anal angle and is bordered distally by a strong reddish brown zone in contrast with the more greyish lilac of the border; the bar crosses the inner fold above the anal angle. Margin with a complete series of reddish orange lunules, inwardly edged with greyish lilac lunules; anal angle with black dots on a lilac ground. Edge of wing black with narrow white fringe. (Pl. 5, fig. 26.)

RANGE. Sierra Leone, Guinea, Liberia, Ivory Coast, Ghana and western Nigeria. Also recorded from Fernando Po.

Charaxes lucretius intermedius ssp. n.

(Pl. 5, figs 27-30, Map 3)

Charaxes lucretius f. incl. *caliginosa* Le Cerf, 1923 : 366.

Charaxes lucretius ♀ f. *albofascia* Le Cerf, 1923 : 367.

MALE. Fore wing, length 40–42 mm (majority 42 mm), thus intermediate in size between the nominate western race and that of Uganda. *Upperside*. Fore wing pattern and coloration generally similar to nominate *lucretius*, and exhibiting the same minor differences in pattern. On the underside however, there is a marked difference, especially in the tone of the ground colour, which is more reddish and with less vinaceous bloom, thus the subcostal black marks of the fore wing from base of cell to discal line are more distinct. (Pl. 5, figs 27, 28.)

FEMALE. Fore wing length, 42–45 mm. *Upperside*. As noted by Rothschild and subsequently by Le Cerf, females of the mid area of distribution differ from the nominate form in being slightly larger, more blackish in ground colour of both wings, and the pale bars more whitish cream and thus in strong contrast with the rufous colour limited to the basal third of the costa and the upper part of the cell and its base; the black cell marks are stronger and larger; the creamy spots of the postdiscal bar usually more elongate; the marginal ochreous spots small but distinct. Hind wing, basal triangle blacker, but the inner fold paler ochreous; the pale bar creamy as in the fore wing, with only a slight ochre tinge above the anal angle; the marginal lunules paler creamy ochre, the edge black. *Underside*. Fore wing, ground colour much paler, less rufescent at base and outer border of wing; the pale bars in less contrast, but the black marks strong. Hind wing, the dark line on outer border of pale bar less strong and rufous; the border is generally paler. (Pl. 5, figs 29, 30.)

Holotype female. CENTRAL AFRICAN REPUBLIC: Bangui, xii.1967 (*ex* Plantrou coll.). In B.M.(N.H.).

Allotype male. Same data as holotype. In B.M.(N.H.).

RANGE. Cameroun, Central African Republic, Republic of the Congo (Moyen Congo), Gabon and the Congo Basin, ? Kasai.

Charaxes lucretius maximus ssp. n.

(Pl. 5, figs 31, 32; Pl. 6, figs 33, 34, Map 3)

Charaxes lucretius var. *babingtoni* Stoneham, 1943 : 46.

MALE. Fore wing length 42–47 mm. *Upperside*. Fore wing, general pattern and coloration very similar to the nominate race but basal areas, especially at base of costa and in cell with an extended rufous cinnamon area, so that the black cell-marks are more clearly visible; the post-discal line of rufous orange spots more uniform in size up to 4, those in 5–6 slightly smaller and rounded, and a spot is occasionally present in 7. Rufous orange marginal lunules well developed and extending from hind angle up to apex. The postdiscal bar is almost straight and is wider than in the intermediate race. Hind wing pattern much as in the nominate race, but rufous orange band slightly darker over the cell area and where it tapers to above the anal angle; the marginal rufous orange lunules rather larger; margin black, bluntly dentate, tails short, 4 and 2 mm; anal angle with lilac spots. *Underside*. Fore wing, ground colour at base of wing paler, more orange, the distal portion less dark and shaded with purplish vinaceous, and more like that of the intermediate race, reddish chestnut. Black cell marks not very strong except that in sub-base; bold black marks sub-basally in 1b–2, those in discal line equally strong. The post-discal bar rufous orange in 1a–2, then fading out; the admarginal black marks at hind angle strong and accentuated by bluish grey streaks distally; margin with orange spots at hind angle, but spots above indistinct and more rusty in colour. Hind wing ground colour more uniform rufous cinnamon, as in the intermediate race; the basal black lines very thin, sometimes obsolete; the bar of upperside hardly indicated, while the postdiscal darker line is not strongly marked; the submarginal pale lilac-grey spots and the admarginal rufous lunules not strong; margin very narrowly black. (Pl. 5, figs 31, 32.)

FEMALE. Fore wing length 46–49 mm, thus larger than nominate *lucretius* or the intermediate race. Though essentially similar in colour and pattern to western examples, Uganda examples differ considerably from those of the mid zones, especially in regard to the bars on

both wings. *Upperside*. Fore wing, ground colour brownish black with a greater area of rufous chestnut at the base, especially at the base of the costa and the cell, where the black marks are strong. The postdiscal bar is narrower in proportion to size, narrower at the hind portion and the spots more separated; the edge of the wing is more rusty, due to bigger spots. Hind wing, basal area black, shading to buffish on the inner fold. The creamy ochre band, widest at the costa, is restricted at 6 rather abruptly, but is somewhat uniform in width to the inner fold; in colour slightly less shaded with orange on outer border but much more creamy-ochreous than in *intermedius*. The black border, almost straight on the inner edge is serrated on the outer by the large conspicuous orange-rufous lunules; margin slightly dentate, but tails very short and stumpy. *Underside*. The whole tone of the underside is paler than that of the nominate race, but not as pale as in *intermedius*. Fore wing, the black marks in the cell less strong, those in sub-base 1b-2 not so bold; the pale spots representing the bar of upperside less strongly marked and the marginal border less dark. Hind wing, the ground colour is paler, more uniformly rusty so that the discal bar is less apparent and less defined on both borders but especially on the outer where the dark chestnut line is much less strong. The admarginal pale angles on proximal side of the rufous border less clear. (Pl. 6, figs 33, 34.)

Holotype male. UGANDA: Mawakota, Kamengo, vii.1953 (*van Someren*), in B.M.(N.H.).

Allotype female. UGANDA: Masaka, Katera Forest, xii.1956 (*van Someren*), in B.M.(N.H.).

RANGE. North-west Kenya in the Elgon and Trans Nzoia districts, to the Kigezi district in western Uganda, also present in the Bwamba Valley and the Semliki area and Kivu district. Specimens from Kigoma to the north-east of Lake Tanganyika seem to belong to this subspecies.

Charaxes lucretius lemosi Joicey & Talbot

(Pl. 6, figs 35, 36, Map 3)

Charaxes lemosi Joicey & Talbot, 1927 : 12.

Charaxes lucretius lemosi Joicey & Talbot; Gabriel, 1932 : 24.

The general pattern and coloration of this insect suggest affinity with the mainland species *Ch. lucretius*, and I support Gabriel's action in placing it as a race of this species.

MALE. Fore wing length 37 mm. *Upperside*. Fore wing, shape slightly more pointed at the apex than nominate *lucretius*, the hind angle of the wing projecting more at 1b. Ground colour rufous at the base and over the cell area, and beyond at bases of 5-7; the black cell bars faintly indicated at sub-base, stronger in mid cell and towards the apex; the rest of the wing black, crossed by a postdiscal row of rufous orange spots more set in than other races of *lucretius* and narrower, the contiguous marks in 1a and 1b 4-3 mm wide, decreasing in size and extending up to the costa; the marginal rufous spots, distinct at the hind angle, extend up to the apex in decreasing size and distinctness. Hind wing, basal area brownish black, shading to more brownish on the inner fold but more rufous above the anal angle; disc of wing crossed by an rufous orange bar 5 mm at widest and slightly paler at the costa, reduced in 5, then almost parallel-sided to 2, where it merges into the inner fold. Border black, widest at 6, tapers to above the anal angle, outer border serrate where it abuts onto the rufous marginal border of contiguous lunules; edged black; tails short and stumpy. *Underside*. Fore wing, somewhat similar to *lucretius* of the east mainland but ground colour more rusty grey; the cell marks finer, but those in the sub-bases of 2-1b strong, those in 1b joined by a 'bridge'; the postdiscal bar moderately well represented, buff-orange in the lower half but tending to fade out toward the

costa; border of wing more greyish, the black marks in hind angle at $rb-2$ strong, the marginal rufous spots strong at hind angle, but fading out above. Hind wing, ground colour generally more rufescent than fore wing, the basal black lines thin, but disco-postdiscal line narrowly whitish, outlined distally by postdiscal brown line, which extends from the costa to above the anal angle; the border beyond is more greyish carrying lilac-grey spots, double and black-edged at anal angle; margin rusty rufous with narrow pinkish lunules proximally; edge narrowly black. (Pl. 6, fig. 35.)

FEMALE. Fore wing length 43 mm. *Upperside.* Ground colour at base of wing brownish, shading to more rusty along the costa and to black in the distal half of the cell and bases of cellules; cell with buff spots in upper half and a more quadrate spot, more whitish in colour at base of 4, with quadrate marks in sub-bases 5-6. The postdiscal bar is whitish, of about even width, 5-6 mm in $ra-3$, then decreasing, the three subapical spots in a straight line, small and rounded; border of wing black, immaculate except for minute white linear marks between veins. Hind wing, ground colour brownish black, blacker on the border; disc crossed by a white bar, widest at costa in 6-7, then narrower to cell, then more constricted where it crosses the greyish inner fold at a slight angle above the anal angle; margin with conspicuous rufous orange lunules, paler on proximal side; anal angle with two lilac spots; edge black; tails short. *Underside.* Fore wing, ground colour greyish buff in subcostal area, paler greyish at bases of $ra-2$; black marks in cell and subcosta clear, the buff-white marks of above, more strongly buff below; black marks in sub-bases $rb-3$ strong and those in rb 'bridged'; postdiscal bar strongly white in $ra-2$, then more buff beyond, arranged as upperside, but accentuated distally by a chestnut bar; the black marks at hind angle in $rb-2$ strong and elongate; border of wing more greyish but margin slightly rusty brown. Hind wing basal triangle as fore wing, greyish buff with slight ochre tinge; black lines fine and rather obscured except those on the proximal border of the white bar which is shaped as above, but crossing the inner fold as a triangle, the upper side at right angles to end of the bar; the bar is distally bordered by a chestnut band defined on inner edge but merging into the more greyish border; the submarginal series of whitish spots distinct; the marginal rusty spot well developed and pale edged proximally; edge black with thin white fringe; anal black spots distinct. (Pl. 6, fig. 36.)

RANGE. Limited to the island of Principe in the Gulf of Guinea.

Charaxes odysseus Staudinger

(Pl. 6, figs 37, 38, Map 3)

Charaxes odysseus Staudinger, 1892 : 260.

Charaxes odysseus Staudinger; Rothschild, 1898 : 5, pl. 7, fig. 4; 1900 : 7, 413.

Although this insect bears some resemblance to *lucretius*, especially *lemosi*, it is best regarded as a distinct species, for it differs markedly in many respects.

MALE. Fore wing length 37 mm. *Upperside.* Fore wing, the basal area rufous but more orange in the cell and subcostal area; the black cell marks are heavier, more triangular in shape, and tend to be conjoined, that in sub-base of cell small and rounded. On the proximal side of the postdiscal bar, the black marks are strong and fill the bases of 2-4, but at 2, the black is angled, tapering off to a spot on ra ; the postdiscal row of rufous orange spots is comparatively wide, 6 mm. in $rb-3$, then tapering, though the spots in 4-6 are of about equal size, that in 7 is small. Thus the black border is narrow, being reduced in width by the large admarginal rufous orange spots. Hind wing, basal area brownish, shading to blackish on the border of the rufous orange band which is relatively wide and parallel-sided; the black border is somewhat narrowed by the broad rufous orange margin. The only specimen available to me is badly damaged in the hind marginal and tornal areas of both hind wings. *Underside.* Bears a general likeness to *lucretius* of the central area, in ground colour, thus paler than in the nominate race. In the fore wing the black subcostal marks are only faintly represented, as are also the tornal

marks, but those at base of 1b are bold and conjoined forming a black 'blob'. Hind wing ground colour more uniform rufous cinnamon. The basal black lines hardly visible; the discal bar only slightly indicated at the costal end; the submarginal pale lunules rather diffuse. (Pl. 6, fig. 37.)

FEMALE. Vaguely resembles the female of *lemosi* above, yet is clearly different. The only specimen available is very damaged, but Rothschild figured a female, presumably the type, which is in the Staudinger collection. *Upperside.* Fore wing length 48 mm. Fore wing, ground colour rufous in basal triangle, shading to brownish black beyond. There are two buff-white subcostal spots in the cell, two or sometimes three at end of cell, the upper one large, followed by two in the upper discal line; the postdiscal series of white spots, 5 mm wide at the hind margin, extends to the subcosta in progressively smaller spots, all well separated. On the ad-marginal, the spots at the hind angle in 1b large, becoming progressively smaller and reaching the sub-apex; these spots are set in from the margin. Hind wing, basal triangle brownish black, the disc crossed by a series of white marks, widest at the costa, 6 mm, extending to above the anal angle in decreasing size and distinctly separated by black veins. The border of the wing is blackish, carrying a series of large white triangular marks in the submargin. *Underside.* Fore wing, ground colour greyish buff, slightly more ochre over the disc; black marks in cell clear, those beyond obscured, but the black marks in basal half of 1b-2 strong and intense black and often conjoined. The postdiscal bar creamy, well marked to 3 then obscured; ternal black marks to 2 strong; admarginal white marks at tornus well marked. Hind wing, ground colour as fore wing; dark lines in basal half, obsolete; creamy discal bar fairly strong, outlined distally by a brownish band which bends toward the inner fold at right angles above the anal angle. Border of wing slightly greyish, the submarginal creamy spots present but not strong in upper half. (Pl. 6, fig. 38.)

RANGE. Confined to the island of São Thomé.

Charaxes montieri Staudinger & Schatz

(Pl. 6, figs 39, 40, Map 3)

Charaxes montieri Staudinger & Schatz, 1885 : 59.

This distinctive insect from São Thomé appears to have no relative on the mainland of Africa.

MALE. Fore wing length 45 mm. *Upperside.* Fore wing, ground colour deep blue-black. Disc of wing crossed by a series of strong blue marks, the upper ones at bases of 6-5 elongate, that in 4 smaller, spots in 3-2 more quadrate, angled distally and just touching the postdiscal marks in same areas, the lower marks fused with the adjoining postdiscal marks; the postdiscal series of blue spots are: three subapical in line, spot in 4 set in, those of 3-2 larger and more elongate, the mark in 1b large and incised distally, the mark in 1a a long streak; margin of wing with bluish interneural spots, double in 1b. Hind wing, basal ground colour blue-black shading to more brownish on inner fold. A strong, broad, disco-postdiscal band crosses the wing from sub-costa to above the anal angle, the upper mark in postdiscal line smaller, the band widest at 4, consisting of elongate marks incised on outer end, each mark separated by black veins. Border black, widest at upper angle and carrying a series of blue, white-centred spots, double at anal angle. Marginal border with angled blue spots; edge black, tails short, upper 3 mm, lower 1 mm. *Underside.* Fore wing, ground colour at base bluish grey to discal line, olive-grey beyond to apex; wavy black lines in cell strong, with a straighter line at end of cell; black conjoined curved lines present in the discal line extending from sub-costa to 1b; subbasal black marks in 1b-2 strong; ternal black marks, double in 1b and rounded in 2, well developed and represented in submargin by obscure olive marks extending to costa; margin with obscure pale internervular marks. Hind wing ground colour olive-grey, basal area crossed by bluish grey bars outlined in black; the bar in discal line outlined in black proximally. In the post-

discal zone is a series of whitish lunules accentuated distally in olive; submarginal zone with pale lunules accentuated distally in olive-brown; anal angle with double black spots; edge of wing olive forming narrow lunules. (Pl. 6, fig. 39.)

FEMALE. Fore wing length 50 mm. *Upperside*. Fore wing basal triangle brownish olive, sharply defined from the white bar by black scaling from subcosta to upper part of 1b. The broad oblique white bar extends from the costa to the hind angle where the bar is reduced in width. Apical portion of wing deep black with two large white sub-apical spots in 5-6. Hind wing, ground colour brownish olive to almost the margin, ornamented with a series of submarginal black ocelli, each with white central spot, large at the upper angle and decreasing in size to the anal angle; the marginal lunules at upper angle whitish. Edge of wing black, bluntly dentate, tails short, upper 4 mm, lower 2 mm. *Underside*. Fore wing, ground colour very similar to that of the male but black marks stronger; the white bar prominently reproduced, as also the postdiscal white spots; the ocelli on the submargin with large black centres, represented at the anal angle by black triangles; the edge of the wing at hind angle white. Hind wing, ground colour and pattern as in the male but on an enlarged scale. (Pl. 6, fig. 40.)

RANGE. Limited to the island of São Thomé, in the Gulf of Guinea.

SYSTEMATIC LIST

Charaxes lucretius (Cramer)

Charaxes lucretius lucretius (Cramer), 1777. Type locality: Guinea.

= *lucretius lucida* Le Cerf, 1923. Type localities: Liberia & Guinea.

Range: Guinea, Liberia, Ivory Coast, Ghana, W. Nigeria.

lucretius intermedius ssp. n. Type locality: Central African Republic, Bangui.

= f. *albofascia* Le Cerf, 1923. Type locality: Cameroun.

= f. *caliginosa* Le Cerf, 1923. Type locality: Gabon.

Range: Cameroun, Central African Republic, Republic of the Congo (Moyen Congo), Gabon, Congo River Basin.

lucretius maximus ssp. n. Type locality: Uganda, Mawakota, Kamengo.

= var. *babingtoni* Stoneham, 1943. Type locality: Kenya, Kakamega. Upper Katanga, ♀ (unexamined).

Range: Eastern Congo, Semliki Valley; Uganda, Bwamba Valley, N. W. Kenya, Trans Nzoia, Elgon and Kisii areas. Kivu. N. E. end of Lake Tanganyika at Kigoma.

lucretius lemosi Joicey & Talbot, 1927. Type locality: Principe Island.

Range: Limited to island of Principe, Gulf of Guinea.

Charaxes odysseus Staudinger

Charaxes odysseus Staudinger, 1892. Type locality: São Thomé.

Range: Island of São Thomé, Gulf of Guinea.

Charaxes montieri Staudinger & Schatz

Charaxes montieri Staudinger & Schatz, 1885. Type locality: São Thomé.

Range: Island of São Thomé, Gulf of Guinea.

3. *CHARAXES PROTOCLEA* FEISTHAMEL AND ITS SUBSPECIES AND FORMS

This species, in its range from West to East Africa, has evolved into three main subspecies, *protoclea protoclea*, *protoclea nothodes*, and *protoclea azota*, each with well defined distributions; in the intervening country, there are aggregates exhibiting characters of adjoining races, thus in Ivory Coast, Ghana and W. Nigeria, the females are transitional between nominate *protoclea* and *protonothodes* and within this aggregate several male forms have been described (Map 4). A corresponding variation in the male is also noted in the population occupying the area Kasai-Katanga, viz. *catenaria* Rousseau-Decelle.

This would indicate a degree of instability, but instability is not limited to these aggregates, for it is noted in other races.

Charaxes protoclea protoclea Feisthamel

(Pl. 7, figs 41, 42, Map 4)

Charaxes protoclea protoclea Feisthamel, 1850 : 260.

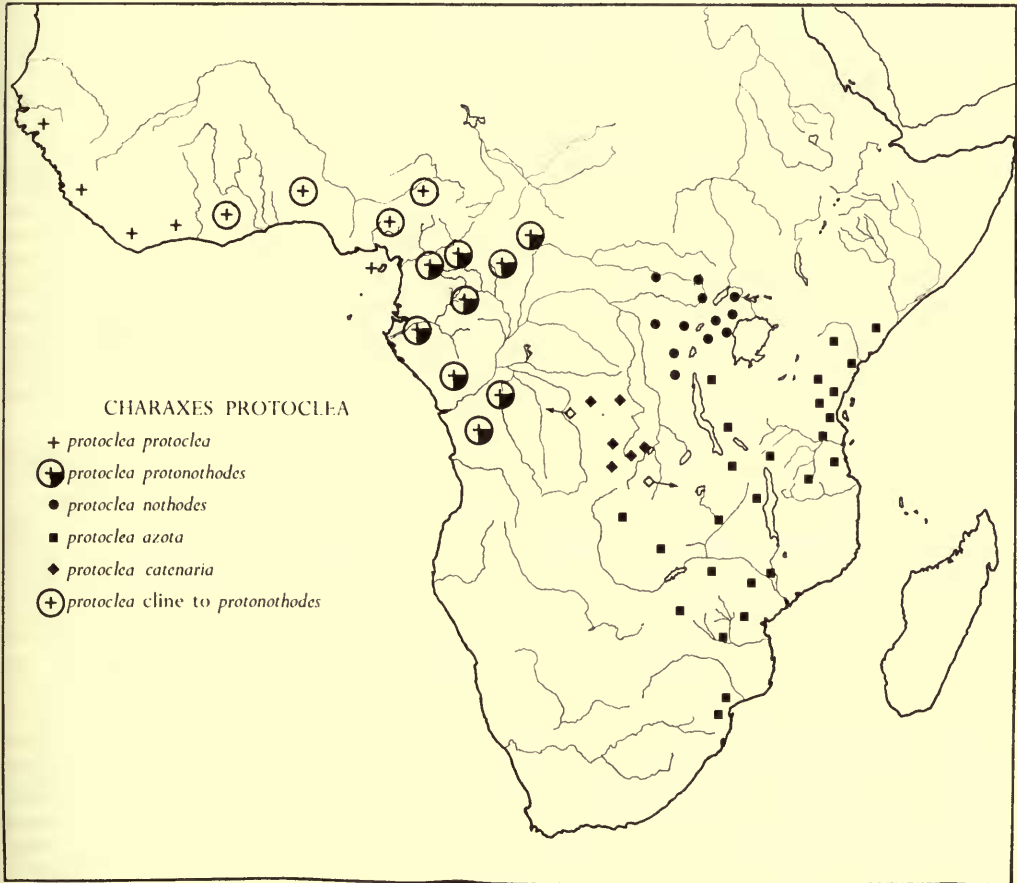
Charaxes aeson Herrich-Schaeffer, 1850 : 54.

MALE. Fore wing length 42–44 mm, but occasionally only 39 mm. *Upperside.* Fore wing, ground colour of fore wing velvety brown-black to black, hind angle of wing with rufous orange margin curving in 1a and extending up margin of wing in 1a–2 in lesser degree, very occasionally represented by smaller spots in 3. Rarely with traces of spots in submargin in 1b–2. Edge narrowly black, with slight white fringe. Hind wing, ground colour brown-black to black, shading to more brownish on the inner fold; border of wing broadly rufous orange, stopping short of costa or abruptly tapering toward it in 7; the rufous orange border may be immaculate or with a varying number of black spots, increasing in size from anal angle to upper angle; edge narrowly black with small white interneural fringe; edge slightly dentate, tails short and blunt. *Underside.* Fore wing, ground colour vinaceous grey. Cell crossed by four purplish chestnut bars of irregular outline; a mark at base of 4 and a zigzag bar crossing the sub-bases of 5–7; a bar crosses sub-base of 3, and there are two black bars each in 1b & 2; submargin of wing with rather indistinct more rufous triangles, more ovoid at costa; tormus more rufous with a large black spot with a conspicuous white mark distally, the rufous area outlined proximally in black. There is a conspicuous whitish spot in the sub-apex. Hind wing, ground colour as fore wing, basal area crossed by chestnut lines, most strongly defined on inner side of discal line; postdiscal zone with more rufescent, conjoined blunt triangles, paler proximally but narrowly edged black; submargin with row of whitish triangles at apices of the marginal rufescent triangles; edge narrowly black. (Pl. 7, fig. 41.)

FEMALE. Fore wing length 45–48 mm, majority 48 mm. *Upperside.* Fore wing, ground colour black, slightly more brownish on border, with a conspicuous white discal band, widest at hind margin, 14 mm, tapering rapidly to 5–6 and a streak in 7, the mark in 4 set well in toward the base; the marks in 2 and 3 angularly incised distally to accommodate the white rounded spots in 2–3 of the postdiscal line, the spots beyond decreasing in size, those of 5–7 curving in toward the subcosta. Hind angle of wing with orange lunules in 1b–3, very faintly indicated in areas above 5. Hind wing, basal triangle black, greyish on inner fold; disc of wing crossed by a wide white band 15 mm broad, of about equal width to 2 then tapering toward, and crossing the inner fold above the anal angle; outer edge of band dentate opposite the end of cell; border black, widest at 4–5, tapering to upper angle and also to anal angle which has two lilac-white spots; margin rufous orange, indented proximally by black serrations on outer border of black zone. Margin bluntly dentate, tails robust but short, upper 5 mm, lower 3 mm. Edge narrowly black, white dots on fringe. *Underside.* Fore wing, ground colour in base a lighter vinaceous grey; cell and subcostal area crossed by rufous chestnut bars as in the male, those in the ad-discal line strong, the two in 1b black in colour. The discal-postdiscal bars creamy in colour; the

tornal double spot and the smaller one above, black, the others of decreasing size on the bases of blunt buff triangles; the subapical brown ovoid mark usually strong. Hind wing basal ground colour as fore wing, crossed by rufous chestnut lines, not strong in the basal area but strongly indicated on the proximal border of the discal bar, which is creamy in colour, the band is crossed lengthwise by a series of light rufous triangles in contact or separated, extending from the costa to above the anal angle, in the postdiscal line; the distal border of the band outlined by a darker rufous chestnut irregular line, faint at costa but strong above the anal angle; border of wing greyish, carrying a series of slightly whitish triangles abutting onto the marginal rufous line. Anal angle with two bluish white and black spots. (Pl. 7, fig. 42.)

RANGE. Described from southern Senegal specimens, the species occurs in Guinea, Liberia, and Ivory Coast; but in Ghana to western Nigeria & ? Fernando Po, there is a cline toward *protonothodes* (Map 4).



MAP 4

Charaxes protoctlea protonothodes ssp. n.

(Pl. 7, figs 43-48, Map 4)

Specimens of *protoctlea* from eastern Cameroun, the Central African Republic,

Moyen Congo and northern Angola present characters which distinguish them from nominate *protoclea*, and suggest a transition toward *protoclea nothodes* of eastern Congo and Uganda. These differences are best seen in the females.

MALE. Differs from the nominate male *protoclea* by being generally larger, fore wing length 43–46 mm. *Upperside.* Fore wing, ground colour deeper black; the rufous orange at the hind angle more restricted, seldom extending beyond 1b; the white marginal fringe more distinct. Hind wing, the rufous orange band is narrower above the anal angle, and interrupted at the upper angle by a black mark in 7 and 6, the spots sometimes conjoined. Tails as in the nominate race. *Underside.* Fore wing, pattern as in nominate race, but ground colour darker vinaceous grey; the discal satiny bar in fore wing stronger, so also that of the hind wing which is bordered by a stronger brownish black postdiscal band; the white submarginal spots stronger. (Pl. 7, figs 43, 45, 46.)

FEMALE. Fore wing length 45–50 mm. *Upperside.* Fore wing, pattern intermediate between nominate female and *nothodes*. The discal band white, strongly graduated, 15 mm wide at the hind margin tapers rapidly, the marks in 2 and 3 incised outwardly to accommodate the post-discal rounded spots in these same areas; the spot in 4 minute or absent, the marks in 5–6 quadrate or linear; all these marks are white, but those of the postdiscal line are creamy ochre. The rufous orange marks at hind angle, strong in 1b, may be absent above 2 or very slightly represented. Hind wing, pattern as in nominate race, but white band broader, encroaching on the black border, and slightly tinged ochreous in 6–7; the outer border of the black band strongly dentate; two white dots at anal angle. The rufous orange border narrower, tails less stumpy 5 and 3 mm long. *Underside.* Fore wing, pattern at base as in the nominate race; the discal band creamy and the postdiscal spots ochreous; the submarginal greyish white marks more strongly developed and the black tornal mark in 1b more linear and with a stronger greyish outer border. Hind wing, basal triangle darker, but the chestnut lines not strong except at the subcosta; the rufous brown line on proximal side of creamy band strong; on the distal side shaded with ochre; the zigzag line in the postdiscal-discal line barely indicated or very broken. The dark band beyond may be strong or faint; the submarginal whitish spots distinct or faint; the border rufescent. (Pl. 7, figs 44, 47, 48.)

Holotype female. CENTRAL AFRICAN REPUBLIC: Bangui, vi.1957, in B.M.(N.H.).

Allotype male. Same locality, i.1965, in B.M.(N.H.).

RANGE. Eastern Cameroun, Central African Republic, Moyen Congo, N. W. Angola.

Charaxes protoclea nothodes Jordan

(Pl. 8, figs 49, 50, Map 4)

Charaxes protoclea nothodes Jordan, 1911 : 137.

MALE. Fore wing length 45–48 mm, exceptionally 50 mm, thus larger than nominate race. *Upperside.* Fore wing, ground colour velvety black, with rufous orange at hind angle as in nominate race or more extended and wider in proportion to the increase in wing size, the spots larger, usually stopping at 2, but may extend up the margin in decreasing size to 4–5. Hind wing, ground colour black, more brownish on lower part of inner fold. Rufous orange border, widest at hind margin, tapers in 5–6 to subcosta; submarginal black dots variable, may be present at hind angle and upper angle; edge narrowly black, tails very stumpy. *Underside.* Fore wing, pattern as in nominate race, but with an overall more rusty bloom, the hind angle more rufescent, but the tornal black spot not very strong; the subapical whitish spot strong or may be double. Hind wing with some rusty bloom so that pattern is less strong; the submarginal white dots present but small, double at anal angle. (Pl. 8, fig. 49.)

FEMALE. Fore wing length 47–53 mm. *Upperside.* Fore wing, basal area brown-black to

black, border of wing slightly browner; the discal band, 15–17 mm wide at hind margin, where the marks are white, tapers strongly from 2 to subcosta, though the marks are generally larger than in the nominate race, all marks strongly tinged with ochreous; the spot at base of 4 is often missing. The postdiscal spots are rather angled proximally, fitting into the incisions of the discal marks, may be contiguous in 1b, all spots orange. Border of wing with rufous orange lunules varying in size and extent from two in 1b at the hind angle to a complete series of diminishing size up to the apex. Hind wing, white band broad, encroaching on the basal blackish area and also on the black border, which is thus narrowed; the band is tinged with orange on the distal border and over the inner fold. The outer border of the black band is strongly serrate, the serrations intruding well into the marginal rufous orange border; the margin of the wing bluntly dentate, the upper tail 5–6 mm, lower very slightly indicated. *Underside*. Fore wing, pattern as in the nominate race, but basal areas and distal borders of the wings more rufous, the discal bands strongly ochreous, the postdiscal spots darker ochreous to orange; tornal black mark strong, so also the elongate ovoid brown subapical mark, accentuated distally with whitish. Hind wing discal patch ochreous, more yellowish distally; postdiscal zigzag brownish line strong or weak, so also the postdiscal brownish bar beyond; border more satiny greyish buff, the small whitish lunules distinct or faint; the edge of the wing more rusty, faintly black on edge with minute interneural white dots. (Pl. 8, fig. 50.)

RANGE. Eastern Congo in region to north-west of Lake Tanganyika; Kivu to Beni and Ituri, extending into Uganda, mostly in the west.

Charaxes protoclea catenaria Rousseau-Decelle

(Pl. 8, figs 53, 54, Map 4)

Charaxes protoclea catenaria Rousseau-Decelle, 1934 : 229.

An unstable aggregate exhibiting the characters of *azota* and *nothodes*, but nearer the former.

MALE. *Upperside*. Fore wing, the main character on which this subspecies can be upheld is the reduction in size of the postdiscal orange spots, so that the series appears more set-in proximad than in *azota*, consequently the width of the black ground separating these spots from those on the margin is greater, and the junction of the two rows in the hind angle is thus lessened, though this character is variable. As in other races, the ground colour is brownish black, more rufous along the costa. On the hind wing, the broad orange-cadmium border is wider and extends further along the costa at the upper angle. *Underside*. Very like that of *azota*, but the paler discal bars of both wings not so strong. (Pl. 8, fig. 53.)

FEMALE. Fore wing length 45–47 mm. *Upperside*. Fore wing, ground colour brown-black, rufous along the costa; pattern intermediate between that of *protonothodes* and *azota*, but much nearer the latter as evidence by the continuous rufous marginal border, the larger postdiscal orange spots and the wider white bar in 1a–1b. On the hind wing the marginal orange border is more uniform in width, the white disco-postdiscal band broader and the intervening black bar clearer. The underside is paler, the black marks less strong and the marginal dark border less accentuated. (Pl. 8, fig. 54.)

RANGE. Southern Congo, in the western Katanga Region; also recorded from the Upemba Park area at Kilwezi and Mabwe by Overlaet.

It may be noted here that examples of *protoclea* from the western region of Tanzania on the east shore of Lake Tanganyika in the Kigoma district to Mukuyu forests are very variable in the male, but they are nearer to *azota* than *catenaria*.

Charaxes protoclea azota (Hewitson)

(Pl. 8, figs 51, 52, Map 4)

Philognoma azota Hewitson, 1877 : 82.*Charaxes azota* (Hewitson) Hewitson, 1878 : 181.*Charaxes calliclea* Grose-Smith, 1888 : 130.*Charaxes nyasana* Butler, 1895 : 249.*Charaxes protoclea* var. *aequidistans* Gaede, 1916 : 109.

MALE. Fore wing length 40–42 mm. *Upperside*. Fore wing, apex rather pointed; outer margin incurved at 3–4. Ground colour black, more brownish and rufous on costa and base of wing. Border rather broadly rufous orange, consisting of a row of postdiscal spots contiguous at the hind angle, more discrete from 3–7, the upper spots curving toward the subcosta; the marginal border of wing orange rufous, the two rows of spots separated towards the apex by black, which also narrowly separates the rufous orange on the border; edge very narrowly black; the degree of separation of the postdiscal spots and those of the border rather variable. Hind wing, basal triangle black, shading to brownish on the inner fold, sharply defined from the wide rufous orange border, which extends from the anal angle to the costa, widest at 2–3. Edge very narrowly black, bluntly dentate, tails very short and stumpy, 3–1 mm. *Underside*. Rather strongly rust coloured, especially on the outer border, the basal area duller, separated by a broad satiny greyish band. Basal brownish bars present but not strongly marked, that in sub-base 1b, darker. Border with only a faint pattern, but tornal spots black, variable in size. Subapical spot satiny grey. Hind wing, basal area rusty brown, shading to greyish on the inner fold; pattern obscure, but brownish line on inner edge of discal satiny bar defined; outer border of band with darker rusty brown irregular bar flanked distally by a satiny greyish zone; border more rusty, carrying a series of whitish dots, double at anal angle, these may be distinct or obscure; edge narrowly black sometimes with faint greyish inner border. (Pl. 8, fig. 51.)

FEMALE. Fore wing length 42–48 mm, mostly 45–46. *Upperside*. Fore wing, general pattern nearest to *nothodes* but white areas more extensive in the hind portion of fore wing, the white extending basad and encroaching on the blackish or brownish basal area, the costa and upper part of cell rufous. The white area of the discal band in 1b–2 extends toward the cell and may actually reach it in 2. The mark in 3 is triangular, incised on the outer end, and is ochreous as a rule as are the two subcostal linear marks, the spot in 4 is set well in and may be clearly defined or obscure, or absent. The postdiscal spots are ovoid, strongly orange rufous, extending from 1b where it is in contact with the discal spot, the spots in 5–7 are curved toward the costa. The upper discal marks and those of the postdiscal line are separated by the black ground to 2, and this black ground separates the postdiscal series from the strong rufous orange border of the wing, which is narrowly bordered with black on the edge. Hind wing, with large discal white patch which reaches almost to the dusky base of the wing and upper part of inner fold, the rest of which is whitish or with a slight ochreous tinge particularly above the anal angle; the outer border of the white patch is slightly sinuous at 6 and is weakly tinged with orange on its border with the black submarginal border which is lightly dentate distally; the border is orange rufous narrowly edged black; margin bluntly dentate, tails thin, 6–4 mm long. Anal angle with two white dots. *Underside*. Fore wing, basal area rufous grey, crossed by rusty brown bars as in the male. The discal band is yellowish ochre and postdiscal spots orange-ochre with dark central dot to each spot, the two bars separated by a darker series of rusty brown lunules; border more rusty brown with obscure dark spots and greyish distally; the tornal black spot weak or strong; the subapical greyish white spots well developed; border rusty with minute white dots on margin at interspaces. Hind wing basal area same colour as fore wing, the darker bars ill-defined except the line defining the inner border of the yellowish discal band; there are rusty lunules, rather indistinct in the postdiscal line but distally there is a more rusty brown line bordering the submarginal satiny greyish lilac border proximally;

this border has a series of white angular marks, double at the anal angle where the ground colour is slightly olive, outlined distally in black (Pl. 8, fig. 52.)

Variation. Occasionally a female is taken in which the ground colour of the fore wing upperside is more rusty brown than black. The postdiscal spots larger and more elongate and contiguous; the hind wing discal white patch is strongly shaded orange distally, resulting in a decrease in the width of the black band which does not reach the costa.

RANGE. From Delagoa Bay through Rhodesia to Zambia and Malawi, the south and western parts of Tanzania, and up the east coast to Kenya where it is limited to the coastal belt and immediate hinterland.

Biological Note

The chief food plants of all the races are *Afzelia cuanzensis* (Caesalpinaceae) in eastern Africa, and *Afzelia africana* further west. The species has also been reared on *Syzygium guinensis* (Myrtaceae). For full account *vide* van Someren, 1935 : 175.

SYSTEMATIC LIST

Charaxes protoclea Feisthamel

Charaxes protoclea protoclea Feisthamel, 1850. Type locality: S. Senegal, Casamance.
= *aeson* Herrich-Schaeffer, 1850. Type locality: Gold Coast.

Range: Senegal, Guinea, Liberia, Ivory Coast, cline in Ghana to western Nigeria; Fernando Po (?).

protoclea protonothodes ssp. n. Type locality: Central African Republic, Moyen Congo.

Range: E. Cameroun, Central African Republic, Moyen Congo, N. W. Angola.

♂ var. *ablutus* Schultze, 1914 : 82.

♂ var. *maculata* Strand, 1910 : 30.

♂ var. *marginepunctata* Holland, 1920 : 206.

♂ var. *nigropunctata* Neustetter, 1916 : 106.

♀ var. *sinuosa* Rousseau-Decelle, 1934 : 229.

protoclea nothodes Jordan, 1911. Type locality: N. W. of Lake Tanganyika, Kivu Prov.

Range: E. Congo region, N. W. Lake Tanganyika, Kivu to Beni, Ituri and W. Uganda.

protoclea catenaria Rousseau-Decelle, 1934. Type locality: Katanga, Kafakumba.

Range: S. Congo, in the Katanga-Kasai areas.

♂ var. *bifida* Rousseau-Decelle, 1934 : 230.

♂ var. *kafakumbana* Rousseau-Decelle, 1934 : 231.

♂ var. *parcepicta* Rousseau-Decelle, 1934 : 230.

♀ var. *mutschatschana* Rousseau-Decelle, 1934 : 231.

protoclea azota Hewitson, 1877. Type locality: Mozambique, Delagoa Bay.

= *calliclea* Smith, 1889. Type locality: Kenya, Mombasa.

= *nyasana* Butler, 1895. Type locality: Malawi, Zomba.

Range: Delagoa Bay to Rhodesia, Zambia and Malawi, W. Zambia and up the coast to Kenya in the coastal belt and immediate hinterland.

4. *CHARAXES BOHEMANI* FELDER

Charaxes bohemani Felder

(Pl. 8, figs 55, 56; Pl. 9, figs 57, 58)

Charaxes bohemani Felder, 1859 : 321.

This species occurs in the greater part of Africa south of the Equator. There does not appear to be any variation throughout its range, both sexes being remarkably stable except for minor colour variation.

MALE. Fore wing length 40–42 mm. *Upperside.* Fore wing, distal half of wing black, basal half pale blue with slight greenish tinge, extending from just short of the cell, obliquely across the wing towards, but not reaching the hind angle at 1a; two subapical white spots in postdiscal line, white, followed by small blue spots, often vestigial, in 5–3. Fringe narrowly whitish. Hind wing, discal area pale blue, shading to ashy grey at base and inner fold; distal border black with series of small blue dots in submargin, double at anal angle; admarginal series of blue lunules distinct at anal angle, fade out at upper angle; edge black with narrow but distinct white fringe. Edge slightly serrate; tails thin and sharply pointed, upper 4–5 mm, lower 3 mm. *Underside.* Fore wing, ground colour fawn-brown, darker at base and in discal area, paler more greyish on the border. Cell and bases of 1b–2 with narrow black transverse lines edged white; inner edge of discal band with narrow irregular black line outwardly edged in white; postdiscal series of ochreous lunules strong at tornus accentuated distally with black marks edged with lilac-grey, becoming faint, but terminating in the two whitish buff subapical spots. Margin with obscure darkish lunules; edge narrowly whitish. Hind wing, ground colour as fore wing, basal and sub-basal black lines faint; postdiscal series of whitish ochre lunules more distinct, black-edged proximally at anal angle; submarginal whitish lilac lunules distinct at hind angle where the spots are double; marginal lunules ochreous, strongest in region of tails; fringe buffish. Underside of abdomen often buff-white or brown. (Pl. 8, fig. 55; Pl. 9, fig. 57.)

FEMALE. Fore wing length 48–52 mm. *Upperside.* Fore wing, distal portion of wing black, basal area pale blue or faintly lilac-blue, the two areas separated by a broad white oblique band, widest from beyond the end of the cell and crossing to just short of the hind angle, this band proximally shaded in black to varying extent, most marked in cell, but fading out in 2–1b, if present. Hind wing as in the male, but blue less strong, often lilac tinged. Border as in the male; tails upper 7 mm, lower 3 mm. *Underside.* Very similar to that of male, but ground colour slightly darker, the white band of upperside strong and sharply marked, accentuated with black proximally; the pattern of spots as in the male but more distinct. This also applies to the hind wing. Underside of abdomen greyish brown like thorax. (Pl. 8, fig. 56; Pl. 9, fig. 58.)

RANGE: North Angola; S. Congo, Kasai and Katanga; Zambia; Lake Mweru, Rhodesia; Malawi; Mozambique; Transvaal and Manicaland; Botswana; Tanzania, in western, central and southern areas; Kenya, in coastal forests, but not penetrating the hinterland to any extent. There is a record of the species from the Chepalungu-Mara area, which needs verification.

Biological Note

The species lays on 'Mbembakofi', *Afzelia cuanzensis* (Caesalpinaceae). For full life history *vide* van Someren, 1928, *Jl E. Africa Uganda nat. Hist. Soc.* 33–34 : 23.

5. *CHARAXES ANTICLEA* (DRURY) AND ITS SUBSPECIES

It is not unusual to find that in Africa, Lepidoptera, especially *Charaxes*, from the western extremity of their distribution are smaller than their eastern counterparts, but in the case of *Charaxes anticlea*, the position is reversed. Why this should be so, is difficult to explain.

As in the case of *Charaxes baumanni*, the characters on which one might base evidence of subspeciation are not very marked, especially on the upperside of the males, and one must examine the undersides. The same applies to the females. By using a combination of characters in both sexes, linked with a knowledge of geography and ecological data, a reasonable assessment can be made.

When Rothschild (1900 : 494) reviewed the species he recognized only two races, the nominate from 'West Africa to the Niger', and the subspecies *adusta* from Kampala, Uganda, to Cameroun. Subsequently, Aurivillius in 'Seitz' (1913) and Bryk (1938) maintained this division.

A close study of a large assembly of the species, from all parts of its known distribution, arranged geographically, indicates that western examples of *anticlea* are larger than eastern. Western examples have a narrow black border to the hind angle of the fore wing, whereas eastern specimens have a broad border. Intermediate populations are transitional in these respects; the underside pattern changes in a similar manner, from a strong to an obscured pattern. In other words, there is a gradual transition from west to east, from nominate *anticlea* to *adusta*, linked by intermediates, some of which are clines, and others are populations deserving of subspecific rank.

Charaxes anticlea anticlea (Drury)

(Pl. 9, figs 59, 60, Map 5)

Papilio Nymphalis Phaleratus anticlea Drury, 1782 : 36.*Papilio Nymphalis horatius* Fabricius, 1793 : 64.

REGION I. SUB-REGION I. SIERRA LEONE TO LIBERIA

MALE. Fore wing length 30–32 mm. Shape, apex blunt, but outer margin strongly incurved at 3–4. *Upperside*. Fore wing, ground colour deep velvety black, immaculate except for a pronounced cadmium-orange submarginal band, widest at the hind angle and extending proximad very slightly into the postdiscal line in 1a; the marks are contiguous in 1a–3, decreasing in size very slightly, then as smaller, elongate lunules to 6 and then fading out; marginal border of wing narrowly black from hind angle to 4. Hind wing, basal half velvety black, shading to brownish on the inner fold; border widely cadmium-orange-red from the anal angle to just short of the upper angle, where the black ground intrudes from the costa; this border has a submarginal series of white-centred black spots, double at anal angle and extending up to 4, and as a dot in 5, which is often missing. Edge narrowly black with some white fringe at anal angle and between tails; margin rather serrate, tails very short. *Underside*. Fore wing, base violaceous grey, cell with three black spots; distal half of wing with a strong satiny sheen; crossing the end of the cell and extending to 1b is a dark purplish brown band outlined in black, the outline ending in large black spots in 1b; in the discal line is a strong satiny band crossing from costa to hind margin, with a dark subcostal patch which extends to the hind margin

as a narrow line separating the satiny band from a series of paler spots in the postdiscal line at the lower part of which are dark patches in the submarginal zone from tornus at 1a-1b; the border more greyish and satiny, broken in the sub-apex by a darker patch. Hind wing, basal colour similar to that of fore wing crossed by a satiny sub-basal bar outlined in black from the costa to the inner fold, this is followed by a darker brown band (continuous with the fore wing bar) distally bordered by a strong satiny discal bar which extends from the costa to above the anal angle where it crosses the inner fold; beyond this is a series of rusty lunules outlined in black on a darker ground; the submarginal area more satiny greyish carrying lilac and black marks on the proximal side of the rufous marginal border; olive at anal angle; edge black with fine white fringe in region of tails. The underside thus has a strong pattern. (Pl. 9, fig. 59.)



MAP 5

FEMALE. Fore wing length 32 mm. Shape of fore wing, less concave on outer margin compared with the male. *Upperside*. Ground colour at base blackish brown, slightly darker on the border; costa slightly rufous at basal half. Wing crossed by a strong disco-postdiscal orange band, conjoined from the hind margin where it is 7 mm wide, to 3, beyond this the lines divide, the upper discal spots directed toward the costa at an angle to the spot in 3; in the post-discal row, the spot in 4 is in line, but the three in the subapex, which are in line, are directed toward the costa at an angle. Hind wing, blackish brown at base, darker on the border; disc

of wing crossed by a broad orange band, 7 mm wide at costa, where it is slightly paler, extending to the inner fold, through which it passes as a narrow strip above the anal angle. The black border carries a series of linear white marks in the region of the tails, double spot in the anal angle; marginal border strong, orange-red from upper angle to lower tail, but olive at anal lobe; edge black; margin serrate, tails rather thin, 5-3 mm long. *Underside*. Generally light rufous, dominated by the orange colour of the disco-postdiscal band and bars of satiny sheen, thus enhancing the darker brownish dull areas of the sub-base, the costal patch between the divided disco-postdiscal band, and that at the apex and margin. Hind wing, the alternating dull and satiny bars are also evident, dominated by the discal pale band. The whole underside is not however so strongly patterned as in the females of the sub-region described below.

REGION 1. SUB-REGION 2. IVORY COAST & GHANA

MALE. Fore wing length 31-32 mm. *Upperside*. Similar in all general respects to nominate *anticlea* of Sierra Leone; the orange-red submarginal border of the fore wing slightly more developed, the black border very slightly stronger. There is no appreciable difference in the hind wing with regard to the orange-red border nor the submarginal spots. *Underside*. Pattern similar to that of topotypical specimens, with a slight tendency toward density of the dark areas contrasting with the strength of the satiny paler bars, but this may vary according to the age of the example.

FEMALE. *Upperside*. Conforming in general pattern to topotypical examples, the fore wing orange bar, usually narrow, but exhibiting some variation, especially in the development of the upper discal spots. *Underside*. Pattern usually strong, a contrast between the pale orange-ochre satiny bars and the darker brownish band of the sub-bases of both wings, and the dark patches on the outer border and tornal area of the fore wing; hind wing, dark postdiscal lunules, with black outline distally, usually well marked; the submarginal paler spots strong.

Charaxes anticlea proadusta ssp. n.

(Pl. 9, figs 61, 62, Map 5)

REGION 2. SUB-REGION 1. E. CAMEROUN AND CENTRAL AFRICAN REPUBLIC

MALE. Fore wing length 30-31 mm. Generally smaller than examples from the Ivory Coast. *Upperside*. Fore wing, general colour velvety black; the reddish orange at the hind border of fore wing more restricted with compensating broadening of the marginal black border. Hind wing, basal half velvety black, reddish orange border slightly deeper in colour; the submarginal white-centred black spots stronger, the spots at upper angle larger, but the orange of the ground colour extending up to the costa. *Underside*. Fore wing, generally darker, the satiny bars and marginal patches more greyish and less shiny and there is a distinct orange-red area in the hind angle corresponding to the orange-red band of upperside. Hind wing, the general tone is similar to that of the fore wing, the discal satiny bar less strong but the postdiscal series of orange-red lunules, outlined in black, are well marked. The submarginal light spots not so strongly developed, but the marginal border is strongly reddish, turning cadmium-yellow at the anal angle, which has two lilac-white black edged spots. (Pl. 9, figs 61, 62.)

FEMALE. Rothschild associated a female from Cameroun with his type male of *adusta* from Kampala, Uganda, but this female belongs to *proadusta*. *Upperside*. Fore wing, disco-postdiscal bar more orange than nominate *anticlea*, slightly wider, the upper spots in the postdiscal line contiguous. Hind wing marginal orange line thin above upper tail, divided by dark veins in region of tails, faint at anal angle. *Underside*. Discal bars stronger, and dark bands heavier; hind wing submarginal white dots larger; posterior marginal orange spots separated by dark veins.

Holotype male. CENTRAL AFRICAN REPUBLIC: Bangui, vii.1967 (*ex coll.* Plantrou) in B.M.(N.H.).

Charaxes anticlea cline from *proadusta* to *adusta*

REGION 2. SUB-REGION 2. CONGO (BRAZZAVILLE) (MOYEN CONGO)

MALE. Specimens from this sub-region of the Congo are smaller and have more pointed fore wings. *Upperside*. Ground colour similar, but fore wing orange-red bar on hind angle narrower. The reddish orange border of the hind wing extended toward the costa at upper angle, as in *adusta*; black sub-marginal spots complete or almost so. *Underside*. Very similar to that of *proadusta*.

FEMALE. None available.

Charaxes anticlea near *adusta*REGION 2. SUB-REGION 3. C. and N. CONGO
(Medje-Stanleyville area)

MALE. Unfortunately, the only specimens available to me are old and rather worn, but on general upperside characters, they approach very closely to *adusta*. The underside is also very similar to *adusta*, the whole being suffused with a rufous tone so that the satiny bars are not strongly represented and the dark bands are less strong. The hind angle of the fore wing and the zone on the hind wing carrying the rusty lunules have a decided reddish tinge.

FEMALE. None available.

Charaxes anticlea adusta Rothschild

(Pl. 10, figs 63, 64, Map 5)

Charaxes anticlea adusta Rothschild, 1900 : 494.

REGION 3. E. & C. & PART OF W. UGANDA

The type of *adusta*, a male, is from Kampala, Central Uganda, and is in the Tring Museum. It is extremely unfortunate that Rothschild had a mixed aggregate before him when he described this race and though he designated a male from Kampala as type, one of five examples from various localities, he described a female from Cameroun as belonging to this subspecies. Furthermore, in giving its distribution, he naturally includes 'Cameroon to Angola, Congo and Uganda'! Apart from the basic differences between males from the west and those of the east, i.e., the width of the black border to the orange band in the hind angle of the fore wing, he stresses the differences between the females from the two regions. While it is true that these differences exist, I have shown that the males within the range of *adusta* as cited by Rothschild, differ considerably. It seems reasonable to suggest that the female from Cameroun is not the true female of *adusta* of Kampala, but of the intermediate *proadusta* ssp. n.

For descriptive purposes, topotypical Kampala examples have been selected.

MALE. Fore wing length 27-28 mm. *Upperside*. Ground colour velvety purplish black, immaculate except for the conspicuous orange-red submarginal bar at the hind angle. This bar is fairly uniform in width, extending from the hind margin to 2 as a block, 4 mm wide, or slightly reduced at 2, with a free spot in 2. The marginal black border uniformly wide, 3.5 mm, increasing in width at 3 proportionately to the reduction in the orange bar. Hind wing, basal half black, shading to brownish on the inner fold; distal part of wing orange-red, extending from the costa to the anal angle, the submargin with row of black spots, those in the tail region

and anal lobe with white dot, the spot in 5 small; edge of wing narrowly black. Margin very bluntly dentate; tails very short and stumpy. *Underside*. The whole with a marked rufous or ruddy tinge so that the satiny bars, though present, are overshadowed; the hind angle of the fore wing is orange, reflecting the orange bar of upperside; hind wing pattern overshadowed by the generally 'ruddy' tone, the satiny lines suppressed; the postdiscal rusty red lunules outlined in black, fairly strong, but the admarginal marks are not strong; margin rusty to lower tail then olive-ochre at anal lobe.

FEMALE. Shape of fore wing, outer margin less concave than male *Upperside*. Fore wing, base and outer border brownish black; the main feature is the very broad disco-postdiscal band, 9-11 mm wide at the hind margin, usually widening in 2, the mark in 3 with inclined ends reducing the width where the two series of marks divide, the discal marks, three in line being directed toward the costa, while the postdiscal are angled, the two or three subapical directed toward the costa. In fresh specimens this conjoined band is orange, slightly paler on the proximal border. Hind wing, base brownish black, border darker, but mid-portion of wing with an equally broad orange disco-postdiscal band paler on the discal line, extending from the costa to above the anal angle, broadest in 4-5; the black border with series of white linear marks most in evidence opposite the tails and anal angle; marginal border orange-red turning olive-ochre at anal angle. *Underside*. Strongly satiny over the pale areas, but the dark brownish bar on both wings on proximal side of discal line well defined, especially distally. Fore wing, disco-postdiscal band buff, ill defined on its outer border, where the postdiscal line carries a series of ill-defined lunules; border of wing brownish. Hind wing, discal band well defined proximally, and on its outer border is a series of rusty lunules outlined in black. Submarginal lilac-black lunules strongest in region of the tails, fade out toward upper angle; marginal border rusty red to lower tail then ochreous olive at anal angle; edge brownish.

REGION 3. SUB-REGION 1. MASAKA, KATERA FOREST, W. SHORE OF LAKE VICTORIA

Charaxes anticlea f. *horatianus* Stoneham, 1936 : 3 ; 1964 : 115 [referred to trinomially as a subspecies, but no formal elevation in status given.]

MALES in this region exhibit some slight differences from topotypical *adusta* from eastern and central Uganda. *Upperside*. Fore wing, orange-red bar at hind angle tends to be wider at base and more graduated, the upper marks often extending to 5 as a series of separate spots. Hind wing, orange-red border rather broad, extending well up into costa at the upper angle, and at lower end the projection into the inner fold is wider; submarginal black spots are usually well developed. *Underside*. Generally similar to that of nominate *adusta*, the whole area being rufous, obscuring the darker bands and the satiny bars; the areas corresponding to the orange-red upperside are dull orange; the postdiscal lunules in the hind wing are rusty-red; the sub-marginals are only present in the region of the tails and anal angle. (Pl. 10, fig. 63.)

FEMALE. Fore wing length 28-30 mm. *Upperside*. Fore wing, disco-postdiscal band very wide 12 mm at 2, with a corresponding broadening of the spots in the discal and postdiscal rows, the marks in each row being confluent. Hind wing, band also broad, 11 mm at 4-5, the extension being on both borders. The marginal border is also wide above upper tail; tails 5 and 3 mm long. *Underside*. Dominated by the dull orange of the disco-postdiscal bands, which are somewhat satiny; the dark brownish bars defined distally; the hind wing band paler, defined proximally, but shading into the more rufous postdiscal zone, which is margined by the rufous lunules; the latter are strongly edged with black, especially in region of tails and anal angle; submarginal pale spots well developed in region of tails but obsolete above. (Pl. 10, fig. 64.)

REGION 3. SUB-REGION 2. KIGEZI, KAYONZA, IMPENETRABLE FOREST

MALE. Fore wing length 29 mm. *Upperside*. In this assemblage the fore wing orange bar

is rather broad at the base with a consequent reduction in the outer black border, and the orange-red spots may extend up to 5. The hind wing orange-red border is broad and extends well along the costa at the upper angle; the submarginal black spots with white centres are strong, complete or interrupted in 5 where the spot is a mere dot. *Underside*. Compared with the previous series, this shows a general darkening, with less rufescent tone overall; the satiny bars are not strong and more restricted to the distal side of the dark bar and sub-apex of fore wing. On the hind wing the postdiscal row of rufous lunules is rather subdued by the rufous tinge to the border; submarginal pale spots restricted to tail region and anal angle; marginal rufous border subdued.

FEMALE. Upperside. Fore wing, disco-postdiscal conjoined orange band is more restricted than in Katera examples, slightly richer in colour and there is distinct indication of a row of dark scales denoting the line of junction of the two series; the upper discal spots are usually well separated from the mark in 3; the postdiscal spots well developed and separated, the third dot at subcosta, if present, is vestigial. The hind wing band is broad, but there is a paler inner zone on the discal line, the postdiscal being darker orange. Submarginal white spots strong in region of tails; marginal border broad above upper tail then narrow to anal angle. *Underside*. With a decidedly stronger pattern than in Katera examples, the dark brown bar on both wings stronger and wider; the interrupted row of postdiscal marks stronger; the rufous lunules in hind wing stronger and the submarginal white spots well developed.

REGION 3. SUB-REGION 3. TANZANIA, N.E. SIDE OF LAKE TANGANYIKA, KIGOMA DISTRICT

This population would appear to be an extension southward of that found in the Kagera district of Uganda.

MALE. Fore wing length 30-31 mm. *Upperside*. There is little difference on the upperside in males from the two areas, the fore wing orange-red bar shows the same slight variation, but narrower in some examples. On the hind wing, the only marked difference is the restricted development of the orange-red border at the upper angle, the upper submarginal black spots merging with the black costa, but this is variable; the submarginal spots are small, often without a white dot, and restricted to the upper angle and the area opposite the tails. *Underside*. Pattern more contrasty, the dark bars broader; the division between the discal and postdiscal satiny bars in fore wing clearer; on the hind wing the rufous lunules in the postdiscal line stronger. (Pl. 10, fig. 65.)

FEMALE. Upperside. Very similar to those of the Katera area, but fore wing conjoined band narrower, the upper discal and postdiscal marks smaller and well-spaced; the hind wing orange band narrower, so that the black border is slightly wider; the submarginal white spots weak and only present in region of tails; marginal border brick-red and strong to upper tail then narrow to anal angle. *Underside*. The dark bar crossing both wings slightly wider, more curved on the distal side in the hind wing; pale bars satiny, but not strongly so; the rusty lunules in postdiscal line well developed, but submarginal lilac and black edged marks variable. (Pl. 10, fig. 66.)

Charaxes anticlea reducta ssp. n.

(Pl. 10, figs 67, 68, Map 5)

This subspecies comes nearest to nominate *adusta* but averages smaller, and the orange-red areas are darker.

MALE. Fore wing length 25-27 mm. *Upperside*. Fore wing, orange-red at the submarginal border at hind angle somewhat narrowed, tapering to 2, with a small spot in 3, occasionally, the hind angle black border is thus broad. Hind wing, orange-red border goes

through to the costa at upper angle; the submarginal black spots, with white centres opposite the tails, usually strong and complete. *Underside*. With a general rufous tone, thus obscuring the satiny bars which would otherwise be fairly strong; the dark bars are narrow, and rather obscured by the overall 'ruddy' tone; the rufous lunules in the postdiscal line of the hind wing clear, especially from the anal lobe to 5, where the rufous line bordering the lunules is 'stepped' proximally. The submarginal white spots, strong in the area opposite the tails and hind angle, fade out beyond. Tails very short and squat. (Pl. 10, figs 67, 68.)

FEMALE. Shape more falcate than other females of the eastern area, the outer margin more concave. Proportionately smaller than female *adusta*, fore wing length 28 mm. *Upperside*. Fore wing, ground colour brownish black, slightly darker on the border. Conjoined orange band paler, but broader in proportion the extension being toward the base; upper postdiscal spots, only three in number separate, the discal spots elongate. Hind wing, band pale proximally but stronger orange on outer border; submarginal white spots small and not extending further than the upper tail; marginal rufous border clear but narrowing in region of tails, ochre in anal angle. (Pl. 10, figs 69, 70.)

Holotype male. KENYA: Chepalungu, ix.1949 (*van Someren*), in B.M. (N.H.).

Allotype female. KENYA: S. Kavirondo, Suna (*van Someren*), in B.M. (N.H.).

RANGE. N. W. Kenya: Lower Sotik, Chepalungu Forest, Suna and Kisii area.

From the above comments, it will be noticed that the aggregates centred around ssp. *adusta* exhibit some local variation, the differences however being insufficient to warrant subspecific rank, except in the case of the small ssp. *reducta* from the Chepalungu Forest.

Biological Note

The species is noted as laying on *Acacia pennata* and *A. goetzii* (botanical material determined by Kew). The butterfly is a forest species, mostly found in clearings and roadways, where the males may be seen at damp mud or feeding on excreta of carnivores. They far outnumber females, which are usually seen in the vicinity of their food-plants.

SYSTEMATIC LIST

Charaxes anticlea (Drury)

Charaxes anticlea anticlea (Drury), 1782. Type locality, Sierra Leone.

Range: Sierra Leone, Liberia, Ivory Coast, Ghana, ?W. Nigeria.

anticlea proadusta ssp. n. Type locality, Central African Republic, Bangui.

Range: E. Cameroun and Central African Republic.

anticlea proadusta cline near *adusta*.

Range: Central and east Congo.

anticlea adusta Rothschild, 1900. Type locality, Uganda, Kampala. ♂.

Range: Uganda, Masaka district, Katera Forest, west of L. Victoria; Kigezi Province, Kayonza Forest (Impenetrable Forest); Tanzania, Kigoma district, N. E. side of Lake Tanganyika.

anticlea reducta ssp. n. Type localities, Kenya, Chepalungu (♂), S. Kavirondo, Suna (♀).

Range: Kenya, Lower Sotik, Chepalungu Forest; Suna, Kisii district; S. W. Kavirondo.

6. *CHARAXES BAUMANNI* ROGENHOFER AND ITS SUBSPECIES

This small species appears to be limited in distribution to the eastern side of the Great Central Rift, ranging from Rhodesia and Malawi to southern Sudan.

The type of the species came from the Pare hills, north of the Usambara Range in Tanzania. The species was described in 1891, and it was also discovered in the mountains in the south of Malawi, at Zomba, and this insect was described and named *whytei* by Butler, in 1893, who apparently overlooked the description of *baumanni*. The species was again described in 1894, as *selousi* Trimen, the type coming from Mineni Valley in Manicaland. Here also there is no reference to *baumanni* Rogenhofer in the description. Aurivillius (1899) associated all named 'species' under the name *baumanni* Rogenhofer. Rothschild (1900) followed this lead, and Bryk (1939 : 497) accepted this view. There the matter rested.

That the species presents a complex problem can be seen at once if one views a collection from all parts of its range, but if this material is arranged in sequence from a geographical point of view, and with some knowledge of geological formations, general topography and ecological environments, what was apparent chaos resolves itself into a picture of regional groupings, each with definite characteristics. It will be noted, however, that in the male the upperside appearance, especially in regard to the development of the fore wing blue spots from area 2 to the sub-apex, is extremely variable even in one locality, but the underside characters are more stable. Females exhibit a greater degree of stability of characters, especially in regard to the formation and width of the white bar on both wings and this can be used as a basis for dividing the species into geographical races. As already mentioned, there is in addition, some degree of stability of underside pattern and coloration, particularly the white line which crosses the discs of both wings from costa to hind angle. Size in both sexes is somewhat variable, but there is some consistency even in this character when the grouping of the species is viewed as a whole.

On this basis, the species from definite areas can be divided, each group exhibiting a degree of stability warranting the recognition of subspecies.

The type of the species is a female, on deposit in the Vienna Museum, but it has been made available to me through the kindness of Dr Kasy.

The suggested grouping is as follows:—

REGION 1. TANZANIA: Pare Hills and Usambara Range: Nguru and Uluguru Hills and including Turiani and Morogoro districts.

SUB-REGION, KENYA: The Teita Range, including Sagala; the Shimba Hills.

REGION 2. TANZANIA: Mt Kilimanjaro, especially on the western side, Arusha and Mt Meru.

SUB-REGION, KENYA: Nairobi district and the Kikuyu Highlands to Mt Kenya and the Njombeni Hills. East of the Rift Valley.

REGION 3. KENYA: West of the Rift Valley, Mau, Elgon, Trans Nzoia, Sotik and Chepalungu Forest.

UGANDA: East and central and part of the western, but not including the Semliki Valley at Bwamba.

REGION 4. UGANDA: The Semliki Valley at Bwamba.

REGION 5. SOUTHERN SUDAN: Didinga Mts; UGANDA: Karamoja and Mt Labwor.

REGION 6. MALAWI, ZAMBIA, EAST RHODESIA.

SUBREGION, TANZANIA: country east of Lake Tanganyika; the Southern Highlands to north of the Rufigi River.

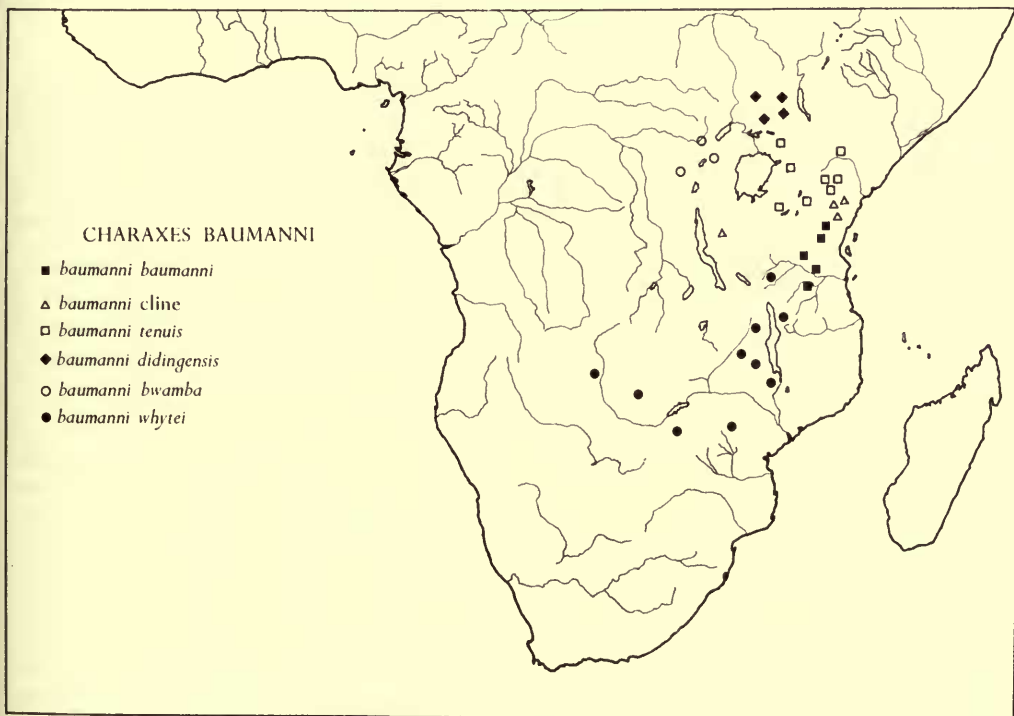
Charaxes baumanni baumanni Rogenhofer

(Pl. 10, figs 71-73, Map 6)

Charaxes baumanni Rogenhofer, 1891 : 564.

REGION I. TANZANIA: Pare Hills and Usambara Range, Nguru and Uluguru Hills and including Turiani and Morogoro districts

MALE. Fore wing length 28-30 mm, majority 29. Fore wing rather pointed due to the inward curve of the margin at 3-4, the hind angle thus projecting at 2. *Upperside*. Fore wing,



MAP 6

ground colour black, the base of the costa slightly brownish (the black coloration in *baumanni* is rather fugitive, turning a brownish black in old specimens). The wing is immaculate except for a series of dull, rather pale blue spots in the postdiscal line, rather variable in size and number, the widest mark is at the hind margin in 1a, then tapering to 2 and smaller separated spots in 3-5, which may or may not be obscure or missing, the spots in the sub-apex in line and white in colour. Margin with very faint whitish scaling between veins. Hind wing, ground colour black, (but subject to fading), more greyish brown on the inner fold. A large bluish white disco-postdiscal patch, more bluish on the borders, is widest at 4, tapers toward, but does not reach, the costa, but may be represented by a small white subcostal dot in 6; the band tapers more acutely at its hind end to above the anal angle and may be represented on the inner fold by a pale spot. The submargin of wing with a complete row of small white spots, double at anal angle and bordered with lilac, distally. Tails thin, pointed, 4 and 3 mm long. *Underside.* Fore wing, ground colour light brownish, with a darker band crossing the disc of the wing from costa to hind margin; this in turn is crossed by a pale whitish line, outlined proximally in black, commencing from beyond the end of the cell and extending to about the mid-point on the hind margin. Cell with a black linear mark at sub-base, followed by two rounded spots, then by two complete black lines, almost straight or wavy at the cell end, these lines outlined in whitish; the long subterminal line is extended through the sub-bases of 2 and 1b. There is a slight satiny sheen over the wing as a whole. The postdiscal zone is slightly paler than the border, without any defined pattern, but with a darker ternal spot at hind angle, in 1b. Hind wing, ground colour as fore wing, the basal area with fine black lines at base and more conspicuously on the inner border of the darker satiny band and outlined in white proximally. The disc is crossed by a whitish line, similar to and continuous with that of the fore wing, crossing from the costa to above the anal angle and is accentuated proximally in black. In the postdiscal line is a series of somewhat obscure rusty lunules, extending from the costa to above the anal angle, with a variable amount of black edging; the submargin carries a series of whitish lilac spots, black distally, double at anal angle; margin with rusty red lunules turning olive at anal lobe. Edge black with slight whitish interneural fringe. (Pl. 10, fig. 71.)

FEMALE. Fore wing length 30-32 mm majority 31 mm. *Upperside.* Fore wing, ground colour black, usually not so black as in the male, and subject to fading toward the base of the wing. Wing crossed by a combined disco-postdiscal strong white bar, from hind margin to 3 where the two series divide up, the discal spots small and irregular in shape, the postdiscals, small in 3-4, are larger, more rounded and in line, two to three in number, at an angle to spots below. The outer margin of the wing less incurved at 3-4 and the hind angle less prominent than in the male. Hind wing basal triangle black, shading to a paler, more brownish colour on the inner fold, the border of the wing usually blacker. The disc of the wing is crossed by a white bar extending from the costa to above the anal angle, the postdiscal spots at the upper end of the bar in 5-6 sometimes free; the bar is widest at the end of the cell and tapers toward the inner fold, and may narrowly cross it. Submargin with narrow white lunules accentuated distally in black, which are conspicuous at upper angle, then almost fade out, but are strong again opposite the tails and double at anal angle and surrounded with lilac. Admargin rusty to above upper tail, then olive at anal angle; fringe narrowly white between the veins. Tails relatively long, bluntly ended, 6-5 mm long. *Underside.* Fore wing, ground colour brownish grey with a strong satiny sheen overall, and a darker band on proximal side of the discal white bar, and between the divided band at its upper part; this dark band crosses the end of the cell and is edged black on both sides. The cell has a sub-basal black dot and two beyond. The white bar, which is almost a replica of that on upper surface, has larger and more defined white spots at its upper part in both discal and postdiscal arms, its outer edge black; there is no distinct pattern on the outer border, but the ternal dark mark is enhanced by a paler surround; the margin of the wing slightly brown in the curve. Hind wing, ground colour as fore wing, but with less satiny sheen; the sub-base is crossed by a rather diffuse whitish line, distally outlined in black. The discal white bar slightly narrower than above, is otherwise of similar shape, but tapers more rapidly to the inner fold; the postdiscal white spots in 4 and 6 more separated and more visible in the browner ground of the border; the submarginal whitish and black spots well

developed; the marginal border rusty reddish to upper tail, then olive at anal angle; edge black. (Pl. 10, figs 72, 73.)

RANGE. Tanzania, Pare Hills and Usambara Range; Nguru and Uluguru Mts and adjacent Turiani and Morogoro districts.

REGION I. SUB-REGION I. KENYA: Teita Range, including Sagala, Shimba Hills

The population in the Teita Hills and Mt Sagala in Kenya conform in the main to the nominate race, on the upper surface, with some degree of variation in the male, and some divergence on the underside. The females conform to the nominate race.

MALE. Fore wing length average 30 mm; shape similar to nominate race. *Upperside*. Fore wing ground colour similar; blue spots as variable, but sometimes well developed. *Underside*. Conforming in general ground colour to nominate *baumanni*, the white bars in fore and hind wing tend to be broader, but this is variable.

FEMALE. Fore wing length 30 mm on average. *Upperside*. Pattern is similar to nominate *baumanni*, as is also the underside.

RANGE. Kenya, on the Teita Hills and Mt Sagala.

Charaxes baumanni tenuis ssp. n.

(Pl. 10, figs 74-77, Map 6)

REGION 2. SUB-REGION, TANZANIA: W. Kilimanjaro

MALE. Fore wing length 27-31 mm, topotypical examples average 28 mm. Fore wing shape as in nominate race. *Upperside*. Fore wing, ground colour black; postdiscal blue to whitish spots variable in size and distribution from broad-based and incomplete to narrow base and complete. Hind wing, whitish blue patch generally slightly larger than in the nominate subspecies; submarginal white spots larger and complete; marginal border stronger reddish to upper tail, a mixture of red and olive between tails, then olive at angle; edge black. Tails longer and rather thin. *Underside*. Darker brown overall and the pattern submerged, the discal white line on both wings very thin. (Pl. 10, figs 74, 75.)

FEMALE. Fore wing length 30-31 mm. *Upperside*. Fore wing, ground colour black; the disco-postdiscal band very narrow, 3-4 mm, the upper separated spots incomplete in discal line and often so in the postdiscal row, the white band from hind margin to 3 also narrow. Hind wing, bar narrower and parallel-sided then tapers rapidly to inner fold but does not cross it, but is represented by a free spot. The submarginal spots sharply defined; the border lunules reddish, then olive, tend to be interrupted. (Pl. 10, figs 76, 77.)

Holotype male. TANZANIA: West Kilimanjaro, vii.1966 (*I. Grahame*), in B.M.(N.H.).

Allotype female. Same data as holotype.

RANGE. Tanzania, West Kilimanjaro and Moshi, Arusha and Ngorongoro.

REGION 2. SUB-REGION, KENYA: east of the Rift Valley

MALE. Fore wing length 28-29 mm; shape similar to nominate race. *Upperside*. Fore wing, ground colour black, more brownish when old. Postdiscal blue spots well marked up to 1b, subapical spots present but those of 3-4 often faint or missing. Hind wing ground colour black, shading to brownish on inner fold. The bluish white patch large, represented on the

costa as a comparatively large spot, the band expands rapidly to its mid point at 4 and continues to the edge of the inner fold, crossing it above the anal angle. The submarginal white spots are well marked, as also is the marginal border, which is less reddish, being heavily mixed with bluish green scaling, but is olive at the anal angle; edge black. Tails slightly shorter and thinner than Kilimanjaro specimens. *Underside*. Fore wing, ground colour brownish, less dark than nominate race, so that the pattern is more visible, but the white discal lines on both wings are narrow and less sharply defined.

FEMALE. *Upperside*. Fore wing, ground colour black; the conjoined disco-postdiscal portion of the white bar in 1a-3 narrow, the divided spots in upper portion usually complete in postdiscal line, but spots in 4-5 in discal line often missing. Hind wing ground colour black; white bar narrow throughout, represented on the inner fold by a conjoined spot. Submarginal white spots less strong and marginal border less reddish, more greenish; edge black, tails as long as but thinner than nominate race. *Underside*. Fore wing, ground colour less dark than Kilimanjaro specimens, the general pattern stronger; the upper discal and postdiscal portions of the white bar wider but less defined, more diffuse and confluent; the lower portion is outlined distally by a black line which separates the postdiscal marks. Tonal dark mark well developed. Hind wing, pattern more clearly defined in the basal area; the discal white bar is strong and defined but narrow, and the irregular dark brownish zone on its distal side more invaded by the paler patches of the border. Marginal border less reddish.

This aggregate is clearly linked with that of the Kilimanjaro area.

RANGE. Kenya, East of the Rift Valley, Nairobi district, Aberdares, Mt Kenya and the Meru area, Njombeni Hills.

Charaxes baumanni interposita ssp. n.

(Pl. II, figs 78-81)

REGION 3. KENYA, west of the Rift Valley; UGANDA, East and Central

The population from this region presents an extremely complex problem. There is a strong similarity to the nominate *baumanni* above and below in the male, but the two groups are widely separated geographically.

MALE. Fore wing length 28-29 mm, majority 29. *Upperside*. Fore wing, ground colour black; post-discal blue to white spots variable, complete to incomplete in mid area; hind wing, bluish-white patch, rather variable in shape, represented in the subcosta by a discrete spot. *Underside*. Fore wing, ground colour brownish with strong satiny sheen, the dark discal zone through which the whitish discal line passes is stronger, but the line is thin to medium in width. On the hind wing, the dark zone on distal side of the white line is darker. (Pl. II, figs 78, 79.)

FEMALE. *Upperside*. Fore wing, pattern very similar to some nominate *baumanni*, but the white bar is slightly narrower; this also applies to the bar on the hind wing. *Underside*. Fore wing, pattern is stronger, the dark patch between the divided discal and postdiscal upper spots of the white bar is narrower, as is also the main portion of the bar. Hind wing, the white bar is more even in width and the dark zone on distal side more divided up; the submarginal spots more distinct, the marginal border less reddish. (Pl. II, figs 80, 81.)

Holotype male. KENYA: Kitale, ix.1932 (*van Someren*), in B.M.(N.H.).

Allotype female. KENYA: Soy, vii.1937 (*T. H. E. Jackson*), in B.M.(N.H.).

RANGE. Kenya, Trans Nzoia, Kitale and Elgon; Uganda, East and Central and western shores of Lake Victoria to the Kagera River.

Charaxes baumanni bwamba ssp. n.

(Pl. II, figs 82-85, Map 6)

REGION 4. UGANDA, Bwamba Valley

A small race with rather pointed wings.

MALE. Fore wing length 27 mm. *Upperside*. Fore wing ground colour black; the postdiscal series of bluish white spots of almost even width from 1a-2, the spots in 5-6 whitish, the whole series complete or faintly indicated at the apical end. Hind wing, ground colour black, the whitish blue patch extending up to the costa and sometimes proximally along its edge, the patch is usually whitish on inner side but more bluish on distal border. The submarginal white spots well developed, but may be faint in mid area; border not reddish but more olive-red and not extending to upper angle, olive at anal angle, the upper tail with a bluish line running its length. Tails comparatively short and robust, 4-3 mm long. *Underside*. Fore wing, ground colour greyish brown, the darker median band not strong but within it, the discal white line is broad and distinct; the postdiscal paler markers are more in evidence, especially that of the proximal side of the dark tornal spot; the marginal border of the wing within the curve is darker. Hind wing, ground colour as fore wing; the pattern within the basal triangle distinct; the dark elongate triangle on the inner side of the discal white line extends almost to the inner fold; the discal white line is broad and extends to the inner fold and is outwardly bordered by a dark brownish zone flanked distally by rusty rufous lunules; the submarginal white and black spots clear, but the marginal border is not strongly rufous, and is heavily mixed with green, olive at the anal angle. (Pl. II, figs 82, 83.)

FEMALE. Fore wing length 30 mm. *Upperside*. Fore wing, very similar to the central Uganda form, the white bar, from hind margin to 3, of medium width, 5 mm, and almost parallel-sided, the upper spots in the median line weak except for the subcostal one; the postdiscal series large, but subcostal one missing, or minute. Hind wing, band of almost even width to edge of inner fold, crosses it above anal angle; submarginal white spots small; marginal border only slightly reddish. *Underside*. General appearance and pattern very similar to the central Uganda form, the distal side of the dark brownish band demarcating the proximal border of the white bars on both wings; the outer border of the fore wing bar in postdiscal line rather diffuse, but the dark tornal spot in 1b is strong. The submarginal spots on hind wing rather weak. (Pl. II, figs 84, 85).

Holotype male. UGANDA: Bwamba Valley, v.1954 (*van Someren*), in B.M.(N.H.).Allotype female. UGANDA: Bwamba Valley, v.1954 (*T. H. E. Jackson*), in B.M.(N.H.).

RANGE. Uganda, western boundary in Semliki Valley, Bwamba County.

Charaxes baumanni didingensis ssp. n.

(Pl. II, figs 86-89, Map 6)

REGION 5. SOUTHERN SUDAN AND ADJACENT NORTHERN UGANDA

MALE. A small race, fore wing length 24-25 mm, apex rather pointed. *Upperside*. Fore wing, series of postdiscal bluish white spots complete and distinct, marks in 1b and 2 narrow, but the streak in 1a extended proximad, these marks strongly blue. Hind wing, whitish blue patch widest opposite the cell, tapering at both ends, the upper represented in the subcosta by a free white mark, at the hind end the patch ends at the inner fold but is here represented by a whitish spot. Submarginal white spots small; marginal border a mixture of reddish and olive, olive at anal angle. Tails relatively long and thin, 5-4 mm. *Underside*. This has a general rufous tinge overall, the satiny sheen reduced in most specimens, border of wing rufous in the

curve; the dark discal band is defined on the inner border but more diffuse on outer, the median white line clear and of medium width. Hind wing, dark median band less clearly defined than in the Bwamba race, but extending further into the inner fold; the whitish median line clear and distally bordered by a rufous area with rusty contiguous lunules within; white and black submarginal spots distinct; marginal border rusty red, edge black. (Pl. 11, figs 86, 87.)

FEMALE. Fore wing length 26 mm. *Upperside.* Fore wing, base of white bar rather narrow and parallel-sided to 3, the subcostal spot in the discal line large, spot in 4 missing, the spots in the postdiscal row, complete, the three subapical well developed. Hind wing, ground colour black, darker on border; the discal white bar wider than bar in fore wing, tapers gradually to the inner fold and is there represented by a whitish spot. Submarginal linear white marks small but clear, the double spots at anal angle with lilac distally. Marginal border reddish to lower tail, then olive at anal angle. *Underside.* Fore wing, ground colour greyish brown, the median dark band rather strongly defined on proximal side and in space between the divided discal-postdiscal white spots; the white bar strongly represented below, but narrow, the postdiscal spots 1-3 represented by whitish lunules, a thin black line separating them from the discal. The ternal black spot distinct. Border of wing browner in curve. Hind wing, basal area greyish brown, the darker median band carried down toward the inner fold, sharply defining the inner edge of the white band, which is almost straight then crosses the inner fold at a slight angle. The white bar is distally defined by a thin black line, beyond which are three brownish patches, separated by greyish white which interrupts the series of rufous black-edged lunules of the postdiscal zone. Submarginal white-black linear marks well developed; marginal border slightly reddish to upper tail but olive at anal angle. (Pl. 11, figs 88, 89.)

Holotype male. S. SUDAN: Didinga Mts, xii.1925 (*G. D. H. Carpenter*), in Hope Dept., University Museum, Oxford.

Allotype female. Same data.

RANGE. Sudan, in southern district, Didinga Mts; also in adjacent area of Uganda, in Karamoja.

Charaxes baumannii whytei Butler

(Pl. 11, figs 90-93, Map 6)

REGION 6. MALAWI, ZAMBIA, RHODESIA

Charaxes whytei Butler, 1893 : 649.

Charaxes selousi Trimen, 1895 : 45.

MALE. Fore wing length 29-30 mm. Shape, slightly less pointed at apex, the costa slightly more curved. (Females especially, have a straighter outer margin). *Upperside.* Fore wing, ground colour black; blue postdiscal spots, widest at the hind margin where the mark is extended proximad, become progressively smaller in 2 and 1b, the spots above small and faint or even missing, the subapical spots, other than that in 6 or 5, usually missing. Hind wing, ground colour black, paler brownish on inner fold; the bluish white patch tapering at both ends rather strongly, represented at the subcosta by a free white mark, the lower border on the hind portion more strongly blue, the extension through the inner fold at an angle to the brownish of the inner fold. The submarginal white spots rather small; marginal border reddish or a mixture of red and greenish, somewhat broken, but olive at the anal angle; edge black. Tails comparatively short and robust, 4 and 3 mm. *Underside.* Greyish brown to brown, with satiny sheen overall; the brownish darker band in disc not very sharply defined but with a black line on inner edge of the whitish discal line, which is broad and well defined on its outer border by the brown of the discal band, the bar turning outward slightly toward the hind angle and the dark ternal spot; outer border of wing brown in the curve. Hind wing, basal area pale brown, defined from the

darker brown discal triangle by a narrow white and black line; the discal white line clear and strong, defined on inner by black and on outer edge by the darker brown zone, which carries a series of black lunules abutting onto the rusty red lunules, which extend from the upper angle to above the anal angle; the submarginal white to lilac and black triangles clear, double in the anal angle on an olive ground; border rusty red; edge black. (Pl. 11, figs 90, 91.)

FEMALE. Fore wing length 30–31 mm, outer margin of wing not appreciably incised. *Upperside.* Fore wing, ground colour nearly black, darker on outer border. White discal bar broad, of about equal width from hind margin to 2–3, the inner edge slightly curved, the postdiscal spot in 2 contiguous, that in 3 more or less free, the rest of the spots large, extending to subcosta or in space below, the discal spots smaller. Hind wing brownish black at base, slightly paler on the inner fold; the white bar broad, 6 mm., the postdiscal spots in 5–7 contiguous to the bar or slightly separated from it, the hind end of the bar and its extension into the inner fold is sharply angled by the dark colour of the inner fold. The submarginal series of linear white marks may be complete and clear or reduced in size in mid area; the marginal border, a mixture of reddish and greenish, then olive at anal angle, is well marked; edge black. Tails black with a central greenish line, moderately long, 5–4 mm. *Underside.* Fore wing, pale greyish at the base, rather sharply defined from the darker brown median band by a white and black line; the fore wing white bar is more or less a replica of above, the postdiscal spots rather clearly defined in the somewhat greyish border; the tornal dark spot is strong and the slight curve of the wing is brown. Hind wing, the basal area grey as on the inner fold, rather sharply defined from the darker brown elongate triangle on the inner border of the white bar, which is similar to above, but the postdiscal white spots are more discrete on its outer border, where the ground colour is brown with rufous lunules outlined in black and interrupted by grey at the upper angle, and opposite the upper tail; submarginal white and black lunules well marked; marginal border red, outlined distally in white, anal angle olive; edge black. (Pl. 11, figs 92, 93.)

RANGE. Malawi, Zomba; Zambia, at Mumbwa in west; and Rhodesia, Manicaland, Umtali, Mashonaland.

REGION 6. SUB-REGION, TANZANIA, WESTERN AND SOUTHERN AREAS

This aggregate exhibits characters which suggest it is a cline between nominate *baumanni baumanni* and *baumanni whytei*, but nearer to the latter.

MALE. Fore wing length 29–30 mm. *Upperside.* Very similar to *whytei* but the underside more brownish, so that the dark discal band is less defined proximally; the whitish discal lines on both wings slightly narrower, but well defined and clear on the proximal side. The distal portion of the hind wing more brown, so that the rufous lunules are less distinct, but the submarginal spots are usually distinct, and clear.

FEMALE. Fore wing length 29–30 mm, rather smaller than *whytei*. *Upperside.* Fore wing, disco-postdiscal white bar broad, 5–6 mm at hind margin, widening slightly in 2, the upper spots complete. Hind wing, white bar proportionately broad. The submarginal white-black marks distinct. The marginal border less clear, a mixture of reddish and greenish scaling, rather narrow and somewhat broken, above the upper tail. Tails long, thin, 6–4 mm. *Underside.* Basal area usually dark brown, so that the dark discal band is less defined proximally, but this is variable. The white bar of the fore wing very similar to that of upperside, its outer border less defined; the dark tornal spot well marked, with some indication of dark marks in the submargin in some specimens. The discal white bar narrower than above; the submarginal white and black spots distinct; the marginal border olive and rufous, the edge black.

RANGE. Tanzania, Kungwe Peninsular, Mpanda district on east side of Lake Tanganyika; Southern Highlands to Newala, north of the Rufigi River.

SYSTEMATIC LIST

Charaxes baumanni Rogenhofer

Charaxes baumanni baumanni Rogenhofer, 1891. Type locality: Tanzania, Pare Hills, north of Usambara Range. ♀.

Range: Region 1, Tanzania, Pare Hills, Usambara Range, Nguru and Uluguru Mts, Turiani and Morogoro. Sub-region, Kenya, Teita Range and Mt Sagala, and the Shimba Hills.

baumanni tenuis ssp. n. Type locality: Tanzania, West Kilimanjaro.

Range: Region 2, Tanzania, Mt Kilimanjaro, on western side, Arusha Moshi and Mt Meru. Sub-region, Kenya, Nairobi district and Kikuyu Highlands, eastern Aberdares, to Mt Kenya and Njombeni Hills; east of the Rift Valley.

baumanni interposita ssp. n. Type locality: Kenya, Elgon, Kitale.

Range: Region 3, Kenya, west of the Rift Valley; Mau, Elgon, Trans Nzoia, Sotik and Chepalungu Forest. Uganda, eastern, central and part of western, but *not* including the Semliki Valley, Bwamba.

baumanni bwamba ssp. n. Type locality: Uganda, Bwamba Valley.

Range: Region 4, Uganda, Bwamba County in Semliki Valley.

baumanni didingensis ssp. n. Type locality: S. Sudan, Didinga Mts.

Range: Region 5, Sudan, south, in the Didinga Mts. Uganda, Northern District, Karamoja, Labwor.

baumanni whytei Butler, 1893. Type locality: Malawi, Zombe.

= *selousi* Trimen, 1894. Type locality: Manicaland.

Range: Region 6, Malawi, Zambia, and eastern Rhodesia, Manicaland. Sub-region Tanzania, eastern side of Lake Tanganyika at Kunhwe; the Southern Highlands to Newala.

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